USING STUDENT PERCEPTIONS

TO EVALUATE THE EFFECTIVENESS OF EDUCATION

FOR HIGH SCHOOL STUDENTS

WITH VISION IMPAIRMENT.

A thesis

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Glossary of Terms

A brief description is given of terms that occur throughout the thesis, specific to the application area. Page references are given for fuller descriptions found in the body of the thesis.

Term or abbreviation	**Description**	**Page reference**
BLENNZ	The Blind and Low Vision Education Network New Zealand was established in 2005, bringing together the various resource centres and the school for the blind into one organisation.	11
Decile	An indicator of socio-economic disadvantage used for allocating targeted funding in New Zealand schools. A decile value of 1 indicates a high number of students who are disadvantaged, while a 10 indicates very few students are disadvantaged. This is explained fully in Appendix 1.	207
Expanded Core Curriculum	A list of the skills needed to be learned by learners with vision impairment, which are additional to those learned by students with no vision impairment.	9
Fund-holder	A school or agency that controls the ORRS funding for individual children with special needs.	12
GSE	Group Special Education. This is a section of the Ministry of Education. It was formerly known as the Specialist Education Service.	13

Term or abbreviation	Description	Page reference
IEP	Individual Education Plan . This is used in several countries including U.S.A., U.K., Australia and New Zealand to guide the education of learners with special education needs. Meetings are held, usually every six months to discuss and set goals for the education of the individual.	4
Orientation and Mobility Instructor (O and M)	Specialist who teaches skills related to getting from place to place for a blind person. This includes cane techniques, map reading and use of public transport.	9
ORRS	On-going and reviewable resourcing schemes. This is the main mechanism for providing funding for students with special educational needs.	12
ORRS teacher	A teacher who is employed out of the 0.2 and 0.1 teacher entitlement for each student who is verified has having High Needs (II) or Very High Needs (III)	12
RTV	Resource Teacher: Vision. These are specialist teachers who generally provide an itinerant service specifically for students with vision impairment. They are usually based in Visual Resource Centres. Their main task is the teaching of the Expanded Core Curriculum.	11
SE2000	Special Education 2000. The current system by which funds are allocated for the education of students with special educational needs.	12
Teacher aide	An person who works under the direction of a trained teacher, generally in this context providing individual help for students with special needs.	11

Term or abbreviation	Description	Page reference
VEA	Vision Education Agency. The VEA is a charitable trust with the purpose of ensuring the advancement and effectiveness of education services to learners who are blind and vision impaired. It maintains a database containing data on all the learners with vision impairment in New Zealand, used for the co-ordination and delivery of services, and research and reporting to the Ministry of Education	127
VRC	Visual Resource Centre. There are located in larger population centres, and are the bases from which RTVs visit students.	11

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Abstract

This research introduces, develops and applies the concept of using student perceptions to measure opportunity-to-learn, in order to evaluate regular and special educational provision.

A qualitative investigation into services for the education of learners with vision impairment identified the common aim of giving students equal access to the curriculum as their sighted peers. It also elicited potential determinants of need that affect caseload allocation decisions.

Opportunity-to-learn was identified as a concept in the research literature, which has evolved from a measure of content coverage into a potential indicator of school effectiveness, measured almost exclusively from the teachers' perception. This research drew on the growing body of research that asks the students, to shift the focus from the teacher to the students themselves.

An instrument was developed, based on the Essential Skills of the New Zealand curriculum, that measures opportunity-to-learn from the perspective of the students. This was used to collect baseline data on 1300 students, with no identified special needs, from twenty secondary schools throughout New Zealand. Analysis of the baseline data demonstrated the validity of the approach, and its potential to aid in research on the educational process, using this set of intermediate indicators. Results showed differences between schools and between girls and boys. The mean index scores for the schools were not strongly related to the socio-economic background of the schools, but did reflect independent measures of school quality.

The instrument was then used to measure opportunity-to-learn for fifty learners with vision impairment in regular high schools. Comprehensive data on these learners was gathered from regular and specialist teachers, parents, schools and the individuals themselves. This data was analysed to evaluate the services and the opportunity-to-learn for the learners with vision impairment. Results showed that on average these students had opportunity-to-learn at least as good as for their sighted peers. Areas of weakness and strength within the service were identified. The instrument proved effective in the evaluation process.

Part A

Setting the Scene

Chapter 1: Introduction

The purpose of educational endeavours is for students to learn. Teachers provide opportunities, funded and supported by the administration at the school level and above. Curriculum decisions are made either at school or national level. However the final result of these efforts is the learning that occurs within individual students. The teachers and the school provide the opportunities to learn rather than the learning itself. Thus an indicator of the school's effectiveness is the opportunity for learning to take place. The aim of this research is to explore the efficacy of measuring opportunity-to-learn using information gained from the students themselves in order to inform decision-making with regard to resource allocation.

The individual nature of the need for educational resources is recognised in many countries in the development of the Individual Education Plan (IEP), used in planning to meet the individual needs of students, particularly those with special educational needs. These special needs may be caused by disabilities including vision and hearing impairment, physical and cognitive disabilities. The research reported in this thesis was initiated in response to a perceived need in the allocation of services for the education of learners with vision impairment in New Zealand.

This chapter provides the background to the rest of the thesis. It begins with a description of the problem that gave rise to the research and an overview of the research as a whole. An explanation of the background of the problem and application area is given, followed by a discussion of the choice of methodology and philosophy. It concludes with the enumeration of the research questions and boundary decisions.

1.1 Overview of the thesis

The research discussed in this thesis arises from the problem of allocating educational resources for learners with vision impairment in an effective and equitable way. As a resource allocation problem, this falls within the domain of management science/operational research or production management. It also has strong ties with research in School Effectiveness, and Educational Evaluation. The problem has parallels with applications of Operational Research in the Health sector.

In the New Zealand education system there are approximately 1200 learners with vision impairment who need additional resources in order for them to overcome barriers to learning. These additional resources usually take the form of services from a "Resource Teacher: Vision" (RTV), assistance from a para-professional such as a teacher aide, other specialist help and equipment. Funding is provided for this purpose by the New Zealand Ministry of Education through the Special Education 2000 (SE2000) funding mechanism. The task of this research is to explore the relationship between the use of the funding and the results, identify areas of effective and ineffective practice, and provide insights and information that can inform future funding decisions.

In principle, the problem of assigning resources for the education of learners with vision impairment is approached at an individual level. Ideally, each learner has an IEP (Individual Education Plan), which states the goals for that individual and his or her service team, and the resources designated as necessary to achieving those goals. However, in New Zealand the IEP does not constitute a service contract, and the specified resources may or may not be provided, depending on the funding and expertise available for that individual learner. The approach taken in this research is to attempt to make more explicit the relationship between the inputs and outcomes, in order to inform decision-makers.

There is no research of this type in the vision education area internationally, or in New Zealand. Dote-Kwan & Chen (1995) provide an overview and analysis of research in vision impairment. They explain that because of the low incidence of visual impairment there is little research and few researchers in this area. They estimated that there are, at most, fifty full-time university faculty members in the area of visual impairment in the United States. The heterogeneity of the population of learners with vision impairment means that sample sizes are generally small, inhibiting the use of empirical research. In New Zealand there are at most three researchers in the area of vision impairment. As pointed out by Dote-Kwan and Chen, researchers in the area are generally more interested in intervention or instructional issues. Thus research into caseload allocation has been minimal at best.

Many caseload allocation decisions within the area of vision impairment are made on the basis of anecdotal evidence, prior practices and beliefs, and are often driven by the level of funding available. The issue of allocating resources for the education of learners with special needs in the regular education system is relatively new, and comes as a result of the move for students to be educated in a mainstream setting rather than in a school or institution specifically for students with particular special needs. There are implications from this work for other disability groups. The results and insights gained with regard to learners with vision impairment, and the method and outcome measurement scheme may be useful in other areas including for the hearing impaired or physically disabled.

Operational Research is a discipline which seeks to improve a problem situation by supplying decision makers with information and insights gained through problem analysis, often involving mathematical modelling. In this research, this way of thinking was applied to an area which has not often attracted the attention of Operational Research specialists, namely special education. The mixed methods approach chosen here, using qualitative and quantitative methods, is also often used in Educational Evaluation.

Originally the intention was to include all ages and levels of disability among learners with vision impairment, in order to create allocation structures and inform caseload decisions. However this proved to be overly ambitious and the scope of the study was narrowed. The age range was narrowed to the first three years of high school, and those students who were in a mainstream setting (regular high school) as opposed to a special school. This meant (given a fixed budget and time frame for the research) that more students could be sampled at each age level, giving a better estimate of the baseline, rather than spreading the sample thinly over a wider range of ages and settings.

The high school age is one area of concern within the area of education of learners with vision impairment. It is sometimes assumed (usually by those not conversant with the educational impact of vision impairment) that once a learner has mastered the alternative format, such as braille or large print, then the work is done, and they can participate with a regular class with little input from a specialist teacher. Secondary school education is also an area where the use of teacher aides is sometimes thought to be less appropriate than that of trained teachers, due to the higher complexity of content taught than at primary school level. Discussion with experts in the sector confirmed that a study concentrating on secondary school students with vision impairment would be of value to the sector.

The research comprises three phases. The first phase (reported in Chapter 2, the preliminary study) is that of understanding and defining the problem and identifying a potential outcome measure. In the second phase (described in Part B – Chapters 3 to 5) an instrument is developed to quantify the

outcome measure and used to analyse data from the regular population. Then in the third phase (Chapters 6 and 7), the instrument is used to collect data on the target population. The results are used, along with other data indicated as necessary in the first phase, to illuminate and evaluate the education for students with vision impairment in secondary schools. This is all brought together in Chapter 8, where the implications of the results and a discussion of the process lead to a description of the strengths, limitations and contribution of the work and avenues for further research.

A major contribution of the research is the development of the concept of and the instrument for measuring opportunity-to-learn, a process indicator that can assist in research and accountability in many areas of the education sector. Underlying this instrument is the hypothesis that students themselves are able to provide useful information regarding the efficacy of their education. This research explores this hypothesis for students with and without identified special needs.

1.2 Education of learners with vision impairment

Vision impairment and the implications for life and learning

Blindness and vision impairment are potentially highly disabling but not very common conditions. Historically blindness has been a most feared and pitied disability. Most people in New Zealand who are blind or have a vision impairment have lost some or all of their vision as a consequence of aging. (Fifty percent of members of the Royal New Zealand Foundation of the Blind are 80 years or older. Royal New Zealand Foundation of the Blind, (2005) Because of improved nutrition, hygiene and disease prevention the prevalence of blindness among children is much reduced in the developed world but there are still some conditions that result in unavoidable blindness and vision impairment. About 8% of the members of the RNZFB are aged 21 years or younger.

The implications of vision impairment are many. Chalifoux & Fagan (1997) explored the definition of "disadvantaged" with regard to children who are visually impaired. They noted that "children who are blind or visually impaired are at a greater risk than sighted children to be considered as disadvantaged." (p 531) Both the families of these children, and adults who are blind or visually impaired, are more likely to have low incomes and subsequently live in substandard housing. The children are likely to have educational deficits, particularly in "non-academic" subjects, and have poorer health, partly as a result of a sedentary lifestyle. In addition, the stress levels in families of children with disabilities are higher than in families of children without disabilities.

In New Zealand, which has a population of about 4 million, there are approximately 1200 young people under the age of 21 who are eligible for educational services related to their vision impairment. This vision impairment includes total blindness (a small minority) through to low vision. A person with low vision is sometimes defined as "a person who has difficulty accomplishing visual tasks, even with prescribed corrective lenses, but who can enhance his or her ability to accomplish these tasks with the use of compensatory visual strategies, low vision and other devices, and environmental modifications."(Corn & Koenig, 1996, p. 4) Vision impairment can include high myopia, colour blindness, sensitivity to light, cataracts, restricted field of vision, nystagmus (difficulty fixing gaze) and the inability of the brain to make sense of what the eye is seeing (cortical blindness). It can be congenital (present at birth), degenerative or adventitious (as a result of an accident). Many conditions can be improved through operations or ameliorated through the use of equipment such as monoculars or tinted glasses. By definition, these young people cannot see as well as the general population, no matter what glasses they wear, and this inability to see, affects their ability to learn. A sizeable proportion (between 30 and 40%) of these students also have other disabilities.

Philosophy of providing extra resources

The need for blind children to receive disability-specific educational instruction has been recognised in many nations for well over a century. In New Zealand the first school for the blind was established in 1891 by the Jubilee Institute, which later became what is now known as the Royal New Zealand Foundation of the Blind.

The New Zealand Ministry of Education defines Special Education as "the provision of extra assistance, adapted programmes or learning environments, specialised equipment or materials to support children and young people with accessing the curriculum in a range of settings." (Ministry of Education, 2005b)

The key objectives of Special Education are:

> improve educational opportunities and outcomes for children with special education needs in the early childhood and school sectors;
>
> ensure there is a clear, consistent and predictable resourcing framework for special education;
>
> provide equitable resourcing for those with similar needs irrespective of school setting or geographic location;
>
> assist in enabling schools to take ownership in meeting the full range of students' needs. (Ministry of Education, 2005b)

The New Zealand Education Act, 1989 states that "People who have special educational needs… have the same rights to enrol and receive education in state schools as people who do not."

The Special Education Policy Guidelines include the following principles:

> 1. Young children and students with special education needs have the same rights to a high quality education as people of the same age who do not have special education needs.
>
> 2. The primary focus of special education is to meet the individual learning and developmental needs of the young child and student.
>
> 3. All young children and students with identified special education needs have access to a fair share of the available special education resources.

4. Partnership between students' families/whanau[1] and education providers is essential in overcoming barriers to learning.

5. All special education resources are used in the most effective and efficient way possible, taking into account parent choice and the needs of the young child or student.

6. A young child or student's language and culture comprise a vital context for learning and development and must be taken into consideration in planning programmes.

7. Young children and students with special education needs will have access to a seamless education from the time that their needs are identified through to post-school options. (Ministry of Education, 2005b)

Principles 1, 3, and 5 are most pertinent to the current inquiry, with their emphasis on rights, a fair share of resources, and using resources in an effective and efficient way.

The curriculum for learners with vision impairment

Internationally, educators and researchers in the area of vision impairment and blindness have developed the "Expanded Core Curriculum for blind and visually impaired students, including those with disabilities" (known as the Expanded Core Curriculum) (Hatlen (1996), Corn & Wall (2002)). The Expanded Core Curriculum includes compensatory or functional academic skills, including communication modes; Orientation and Mobility[2]; social interaction skills; independent living skills[3], recreation and leisure skills; career education; technology; and visual efficiency skills[4]. These are all skills and knowledge that the students need to learn, that are acquired in the same way as for sighted children. This is because, as Hatlen (1996) states, "Experiences and concepts casually and incidentally learned by sighted students must be systematically and sequentially taught to the visually impaired child."(page 27) As would be expected, there is a difference in the degree to which this is the case, dependent on the level of useful vision the child has. A totally blind child may need to learn to read

[1] Maori term for extended family.

[2] Orientation and Mobility teaches students how to get around safely, and know where they are. It includes cane skills, sighted guide techniques and safe road crossing.

[3] Independent living skills are referred to as Adaptive Daily Living or ADL in New Zealand. This encompasses a wide range of skills of daily life, including dressing, cooking, tying shoelaces, laundry, and personal hygiene.

[4] Visual efficiency skills help a student with low vision to make the best use of his or her vision, through strategies such as ensuring optimal lighting, correct print size and colour, and the best angle and distance from which to view an object of interest.

and write using braille and audio media. Children with low vision may need to learn how to use magnifying equipment and how to make the most of what vision they have. Children with multiple impairments may need to learn to use sign language in order to communicate. All of them may need to be taught social skills and independent living skills.

Mechanism of delivery

Most students with vision impairment receive their education at their local regular school or at a special school for students with vision impairment or in a combination of the two options. The students in a regular school generally receive additional assistance from itinerant services or from a resource room based in the school. The degree of choice as to which settings are available varies with location. In the United Kingdom and in many parts of the United States there are well-established residential schools for the blind, and parents can decide whether their child will attend one of them (sometimes as day students) or their local school. Currently in New Zealand there is very little option but for the child to attend their local school with itinerant services. In the United States it is estimated that “as of 2002, over 85% of students with visual impairments were served in general education classrooms at least part of the time.”(Correa-Torres & Howell, 2004, p. 420) Dote-Kwan & Chen (1995) noted that, at 8.8%, “the placement in residential facilities was the third highest for students with visual impairment as compared with other disabilities categories.” (p 211) The two groups that had a higher proportion in residential facilities were deaf-blindness (25%) and hearing impairment (11%). Residential facilities still have a major part to play in the education of learners with vision impairment.

The relative advantages of mainstreaming (a common term for education in a regular school setting) and special schools have been debated thoroughly for many years in the Vision Education literature. Many of the articles (usually authored by researchers involved in special school education) point out the flaws of the itinerant model (Hatlen, 2004) and discuss the importance of choosing the correct placement (Curry & Hatlen, 1988). The current opinion seems to be favouring a combined model, with special schools providing backup to the itinerant services (DeMario & Caruso, 2001; Zebehazy & Whitten, 2003). Correa-Torres & Howell (2004), based in Colorado, reflect the current view when they state, “Itinerant services, resource rooms, self-contained classrooms, and residential school should all be available to students with visual impairments, depending on their needs and educational goals.” (p. 421) It is this model that has been selected as a guide for the new system being developed in 2005 in New Zealand. A common issue in the discussion regarding service provision and the efficacy of the service is the effect of high caseload levels among the itinerant teachers.

Another cause for concern expressed in the literature, among teachers of the vision impaired, and vision impaired people themselves was the attempt to have generic special education staff provide services for students with vision impairment. Gallagher (1988), who is himself a blind person, vehemently protested that the needs of blind and visually impaired people are unique, different from people with other disabilities. This particular issue may be diminishing, as there has been little literature about it recently. The production and dissemination of the Expanded Core Curriculum may have sufficiently clarified the individual nature of the needs of learners with vision impairment, to reduce the move towards generic services.

The New Zealand situation

When this study commenced (1998), vision education in New Zealand was in a state of flux. At the time of writing (2005), however, parents and educators are celebrating the establishment of Blind and Low Vision Education Network New Zealand or BLENNZ. This brings into one organisation the fifteen regional visual resource centres and resource room and the national centre. At one stage the national centre, located in South Auckland, was a residential school for many learners with vision impairment, but it now focuses on providing short-term placements and education for learners with complex needs. It is intended that BLENNZ provide for all the needs of the students throughout New Zealand, no matter what setting they are in, by using a flexible mode of delivery with a mixture of itinerant services and short term placements in larger centres.

The students in the mainstream settings can be supported by a mixture of resources in order to enable them to have access to the curriculum, and in particular the expanded core curriculum. These resources include

- time with a specialist (usually itinerant) teacher known in New Zealand as a "Resource Teacher: Vision" or RTV,
- teacher aide support (usually to an individual student) in the classroom,
- extra individual or small group time with a qualified subject or mainstream teacher,
- Orientation and Mobility instruction from specialist instructors, and
- materials converted to alternative formats such as audio, large print or braille.

A "Resource Teacher: Vision" or RTV, is a teacher who specialises in the teaching of learners with vision impairment. Most RTVs provide an itinerant service, based in a Visual Resource Centre, from which they visit students with vision impairment in their schools. Their particular focus and

responsibility is teaching the Expanded Core Curriculum Hatlen (1996), working in addition to the classroom teachers, who are responsible for teaching the regular curriculum.

A teacher aide is a para-professional employed by the school, who assists the teacher by assisting the student with special needs in a variety of ways (Lai, Sinclair, Naidoo, Naidoo, & Robinson, 2003). Their tasks with regard to learners with vision impairment include preparing materials, instructing students, providing sighted guide assistance, reading material from worksheets and the whiteboard, assisting with self-care routines and providing liaison between the teacher and the parents (author's personal experience and Russotti & Shaw (2002)).Teacher aides are almost exclusively women and work part-time for low pay. It is a source of concern among teachers and parents of students with special needs that teacher aides often provide the main teaching for the students, despite their being neither trained educators nor specialists in curriculum areas. The concerns regarding the role of teacher aides are described further in the results section of Chapter 2.

Less frequently, students may also receive help from a range of other specialists, including: speech-language therapists, occupational therapists, psychologists, physiotherapists, recreation advisors and social workers.

The children's needs, and their expectations, differ according to their level of schooling, age, degree of vision impairment, other physical disabilities and various other factors. Most of the services are funded by the Ministry of Education, generally through funding for special education. Students whose vision impairment has occurred as a result of an accident have their special needs met by the Accident Compensation Commission (ACC). In general this has resulted in a higher level of provision than for those funded by the Ministry of Education, which leads to these students receiving a better level of input in some areas than the other students with vision impairment. As there are very few such students (one out of fifty in the final sample) this effect has not been addressed in this research.

The policies of Special Education 2000 guide the funding allocation. There are three levels of need designated within special education. The categories are Very High Needs (III), High Needs (II) and Moderate Needs (I)[5]. Those who are in the first two categories receive funding entitlement through the Ongoing and Reviewable Resourcing Schemes (this is referred to as being ORRS funded). The ORRS funds are allocated to a fund-holder for each child, which may be the child's school, if the school has sufficient students with special needs. The most common fund-holder is Group Special Education

[5] The designations, Very High Needs, High Needs and Moderate Needs are specified by SE2000. The numbers, I, II and III are added in this thesis for clarification.

(GSE), a part of the Ministry of Education. The funds for the students with Moderate Needs are not provided for individual students, but rather all schools are allocated a demographically indexed per-capita allowance to provide for all such students on their rolls.

Assuming that level of need occurs on a continuum, then the use of three discrete categories will lead to a high level of variation within the categories and sometimes very little difference in need between two similar students who have been placed in separate categories.

Current funding arrangements

The method for the actual disbursement of funds is rather complex, often involving more than one fund-holder and several service providers for one individual learner. The following information is partly the result of an interview in 2003 with Verna Stewart of Group Special Education Canterbury (fund-holder for about 470 ORRS funded children in the Canterbury region). It gives an example of how the funding can be dispersed.

Group Special Education (GSE) receives $12947 for each Very High Needs (III) child and $7549 for each High Needs (II) child for whom they are the designated fund-holder. These funds are split into 70% to provide teacher aides and 30% to provide specialist staff. The teacher aide funding provides, on average, 17 hours per week of teacher aide time for each Very High Needs (III) child and 10 hours per week for each High Needs (II) child. These hours are reallocated by a moderating panel, deciding which children need more or less than the average amount. The pooling and reallocation of funding is in response to the continuous nature of the level of need – some students will require more and some less than the allocated amount. (This is often known as “unders and overs.”) The other 30% of the funding provides specialist services such as occupational therapy, physiotherapy, etc. Most of these services are provided by teams from GSE, except Orientation and Mobility, which is contracted out to the RNZFB, as will be explained later.

However, if a child attends a school which is designated as a fund-holder, then the funding path is different. All of the funding is allocated to the host school, rather than GSE, which then reallocates it at its discretion among the pupils with special needs to pay for teacher aide time, specialist time, smaller classes and specialist provision.

There is an additional operating grant of $500 per Very High Needs(III) child and $250 per High Needs (II) child per year, allocated to the school at which the child is enrolled. The Ministry of Education provides transport assistance to get the children to and from school, school property modifications, such as wheelchair ramps and lifts, and equipment. Students who use braille are usually provided with a Braille-Note® (similar to a laptop computer with Braille input and speech and

Braille output) costing $15 000, before they begin secondary school. This is paid for by the assistive equipment budget. Low vision students may use closed circuit televisions or other devices to enhance their vision, many of which are funded from the assistive equipment budget. The decisions regarding transport and equipment are made centrally by the Ministry of Education, rather than within the Visual Resource Centres and so were outside the boundaries of this study.

For students who are verified as having Very High Needs (III) or High Needs(II) there is an allocation of teacher time of 0.2 and 0.1 of a teacher respectively. This time allowance is added to the staffing allowance for the school at which they are enrolled (host school), and can be used in a variety of ways. In Christchurch, the Elmwood Visual Resource Centre (VRC) applies to the individual host schools for the ORRS teacher time to be transferred over to them, to employ the RTVs to provide the specialist support. In most other centres this is not the case, and the ORRS teacher time is used to provide teacher time additional to the RTV time. In late 2003 the Ministry of Education took steps to encourage the reallocation of the ORRS teacher time to the Visual Resource Centres in all areas of New Zealand. The use of the ORRS teacher allocation is still inconsistent.

The Royal New Zealand Foundation of the Blind is a service provider for students with vision impairment, independent of the service provided by the itinerant teachers. Orientation and Mobility instructors provide services to the children under contract to fund-holders and to the Ministry of Education. Instruction in Activities of Daily Living (ADL), a further aspect of the Expanded Core Curriculum, is provided by the RNZFB, funded by the Ministry of Health. These services are quite a recent initiative, however, and come as a result of the change of focus from the RNZFB, and requests by parents and RTVs.

The problem of caseload sizes

The Visual Resource Centres (VRCs) receive funding from the Ministry of Education in a variety of ways. Before Special Education 2000 was introduced, the resource centres were funded individually according to historical precedent. A new teacher position was formed, not by using a formula based on roll growth, but rather as a result of lobbying the Government by parents and teachers. This resulted in considerable inequity between provision in various centres. When SE2000 was introduced, the staffing situation at the time was “grandparented”[6], further perpetuating the inequities. However some centres have managed to establish more staff positions by having host schools sign over the 0.2 and 0.1

[6] The term, “grandparenting”, is used to describe carrying over previous provisions or allocation methods when a new system is developed, often for a limited period of time, such as until the students concerned no longer need a service.

staffing entitlements they receive for ORRS funded students, in return for service provided by RTVs from the VRC. There have been issues with gaining funding for support services, accommodation and transport for these positions, however.

In short, there is a complex funding mechanism to provide a variety of services to learners with vision impairment, that is not strictly roll-based. There are no caseload standards established.

Of the 1200 learners with vision impairment, a majority (about 75%) are taught in regular education settings supported by RTVs and teacher aides. The remainder, who are in special settings such as Homai National School for the Blind and Vision Impaired or units for physically disabled, generally have additional special needs, such as an intellectual, physical or hearing impairment. The RTVs provide itinerant services from regional visual resource centres throughout the country to learners aged up to twenty-one years, in regular classes and in special settings in their geographical area. The teacher/learner ratios for RTVs in New Zealand range between 1:20 and 1:56, with an average of 1:34 (Nagel, 2001, p.22). There is a very low incidence of vision impairment in the school-age population. This low incidence results in an uneven distribution throughout the country, and very little in the way of economies of scale in providing services for these learners. It also makes planning with regard to staffing levels challenging.

Internationally the caseloads for itinerant teachers are also extremely variable. Olmstead (1995, p. 546) found a wide range of caseloads for teachers of learners with vision impairment in California. The caseloads ranged from 5 to 61. A large majority of teachers questioned in that study agreed that maximum caseload sizes for itinerant teachers should be mandatory. One itinerant teacher was quoted as saying that “I have noticed a trend. As caseloads increase, so does the tendency to consult rather than provide direct instructional services” (Olmstead , 1995, p.548).

Pagliano (1989, p. 35) stated that "differences which do occur in Australia appear to be mainly owing to the lack of national legislation and the absence of a strong research base. Decision-making in Australia has tended to be regional and primarily determined by a combination of demand, availability of human and material resources, and international trends." This does not appear to have changed.

Correa-Torres & Howell (2004) interviewed 23 itinerant teachers in Colorado, USA, about their role and the positive and negative aspects of their jobs. They stated that with large (sic) caseloads for itinerant teachers (an average of 17 per caseload for the participants in that study) it was “difficult for teachers to provide effective services for all students.” (p. 426) A study of role determinants of teachers of the visually impaired in British Colombia, Canada, found that the median number of students per teacher was approximately nine, though this was affected by geographical spread (Hass,

1994). The estimated figure for average caseload per teacher in the United States was fourteen (Kirchner & Diament, 1999), while a recommended caseload was eight (Griffin-Shirley et al., 2004).

MacCuspie (1998) published guidelines on the web for determining caseload size of teachers of students with visual impairments. For each category of student, the number of hours recommended for direct service, consultation, adapting materials and preparation are given, which can be used when assessing workload. Personal correspondence with the author indicated that the figures were based on experience working in the field, but not empirical research. (A. MacCuspie, personal communication, 14 August 2000)

RTVs internationally feel stretched. Smith, Geruschat, & Huebner (2004, p.625) described resource teachers in the United States as serving "large and heterogeneous groups of students, each with their own individual educational requirements. The students are typically dispersed over a large geographic area and their teachers are equally "stretched" by geography, large caseloads, meetings, report writing, and numerous other work demands that take half their time away from direct teaching." Researchers indicate gaps in the provision of the expanded core curriculum, notably social skills and technology. Articles on outreach by special schools often cite itinerant teacher overload as a reason for the need for short residential courses at special schools.

In New Zealand there was a general feeling among specialist teachers and parents that the service provided was not meeting the needs of all the children, due to under-funding in most geographical areas, and a lack of co-ordination and consistency between centres. Requests by lobby groups to the government for extra funding were less successful because they were not supported by research. Following a survey of professionals and parents in the field, Pillay & Thorburn (1997, p. 88) considered the question of "how to develop a New Zealand-wide system, so services can be delivered effectively and fairly to students wherever they live" to be a top priority for future research in New Zealand. The system has now been established, but the caseload levels are still not acceptable to the stakeholders.

Before embarking on an attempt to develop research-based caseload standards, authorities in the U.S.A. and in the U.K. were contacted, asking for information on resource allocation and caseloads. The response from the Director of the Hilton/Perkins program at the Perkins School for the Blind in Massachusetts U.S.A. outlined the role of the IEP and the legislative process. He commented "Therefore the services which children receive on a local level vary tremendously and are not always reflective of need. There are no child-specific criteria." (M.T. Collins, personal communication, 20 October, 1997). The response from the Assistant Director, Education and Employment, at the Royal National Institute for the Blind in the United Kingdom explained about the local approaches to

funding, and concluded, “In summary, there is no national system in place and funding varies enormously from local authority to local authority and from child to child. It is by no means unheard of for parents to move from one local authority to another to secure better educational provision for their visually impaired child.” (E. Fetton, personal communication, 6 November, 1997).

This research was begun with the intention of providing information regarding ideal caseloads, and developing research-based caseload formulas. A consequent study of the nature of school effectiveness research and attempts to develop education production functions for regular school children indicated that even for the general population, issues such as class-size or school-day length are difficult to establish and the source of ongoing research and debate. In the face of this difficulty in quantifying much of the education process for the regular school population, it became clear that a more realistic aim for this study was to provide information that would inform caseload decision-making.

1.3 Choice of methodology

The nature of the problem and the research paradigm

The problem that initiated this research is that of allocating educational resources to a heterogeneous and sparse population with special needs in order to provide the best outcomes. At the beginning of the research, the nature of the educational resources provided, the characteristics of the population, the desired outcomes and the relationships between them were all ill-defined. The approach to the problem needed to include defining each of the inter-related areas before beginning to explore the inter-relationships.

This problem involves both “soft” or qualitative and “hard” or quantitative aspects. The soft aspects are those that relate to human activities and the diverse nature of the individuals involved. People do not fit neatly into categories, nor are they easily measured in the way that manufactured goods or physical effects can be. Quality of service and level of need are both qualitative concepts that can be quantified to a certain degree, but only by approximation or proxy measures. The term “hard” is used to refer to aspects that can be directly quantified such as hours of service provision, and the funding provided for individuals and groups of students. These are more easily measured and the figures manipulated to give information. However even the so-called “hard” figures may mask a high degree of variation or hidden softness. For instance, an hour of teacher aide time may be allocated to a student, and it can be used for one-on-one tutoring, assistance in a large classroom, production of materials or helping a small number of students, including the student for whom it is ostensibly provided.

In this research the problem is approached from an Operational Research paradigm. Operational Research/ Management Science is a discipline which seeks to improve a problem situation, using modelling. Operational Research as a discipline was originated/developed to deal with problems involving both hard and soft aspects, and consequently the discipline has diversified in hard, soft and mixed directions. Operational Research is used to solve hard (numerical) problems related to physical systems such as coal mines, electricity generation and distribution networks, and at the other extreme it is used for interventions into hospital closures, homeless teenagers and company restructuring. In between lie problems such as flight crew scheduling, which uses a quantitative method, integer programming, to provide solutions that will suit the people involved, who have diverse and often conflicting needs.

As the application area for this problem is Education, the problem could be classified as falling within the area of Educational Evaluation; this also provides a way of approaching the problem. Educational Evaluation, like Operational Research, deals with problems that are both qualitative and quantitative in nature. Evaluating a school or educational programme will include both human aspects and quantitative aspects. The emphasis is less on problem solving than it is in an Operational Research study, and more on providing an analysis as to the state and efficacy of the programme in question for a particular set of stakeholders.

It is interesting to explore the comments of Berliner (2002, p. 18), who, in a play on the meaning of "hard", calls Educational Research the "hardest science of all". In response to an emphasis by the US Government on "evidence-based practices" and "scientific research", he suggests that though physics, chemistry and geology are often called "hard sciences" and contrasted with the social sciences which are considered as "soft sciences", the distinction is really between "easy-to-do" science (physics, chemistry etc) and "hard-to-do" science (social science and educational research). Many of the key practices or possibilities of physics, chemistry etc: controlling the context, replication, generalisation over setting and time are not possible in Educational Research. He suggests:

> We should never lose sight of the fact that children and teachers in classrooms are conscious, sentient, and purposive human beings, so no scientific explanation of human behaviour could ever be complete…. When stated this way, we have an argument for heterogeneity in educational scholarship."(Berliner, 2002, p. 20)

The process that was used in this research combined a qualitative interview-based inquiry with statistical modelling to define the aspects of the problem and provide the desired insights. This approach is now examined with respect to both the OR and the Educational Evaluation disciplines.

The Operational Research Approach: Multimethodology

Ackermann, Eden, & Williams (1997, p. 49) suggest that some Operational Researchers "are developing methods to try to resolve some of the limitations of the quantitative methods, to add to the power of quantitative methods and to provide further benefit to managers by focussing on predominantly qualitative data and unstructured problems." They then give as examples, SODA(Strategic Options Development and Analysis), Strategic Choice and Decision Conferencing which are soft methods developed within the OR literature. In their study, "Modelling for Litigation: Mixing Qualitative and Quantitative Approaches", a combination of "soft" and "hard" Operational Research methods was used in order to meet the needs of the problem.

In “Multimethodology: Towards a Framework for Mixing Methodologies”, Mingers & Brocklesby (1997) take a closer look at the practice of combining different OR methods and how this can deal more effectively with the richness of the real world and better assist through the various intervention stages. They suggest that there are four arguments in favour of multi-methodology: the complexity of real world problems, the multi-phase nature of many interventions, the observation that people are already using it in practice and that “arguments from a postmodern perspective also support pluralism in methodology.”(p. 492) They also observe that most management scientists who are competent in both hard and soft methodologies have been competent first in the hard aspects, then moved towards softer methods.

Ormerod (1997) draws on his own experience in applying Operational Research to explore the use of mixed methods. He describes, in chronological order, seven interventions which covered traditional O.R., Hard Systems, Soft O.R. and mixtures of these methods. He concludes that O.R. consultants “should adopt an eclectic approach. The key is to hone one’s craft skills, learn a number of methods and note when and where they seem to work.” (p. 57).

Mingers (2003) proposed general characteristics that Management Science/Operational Research methodologies share. He stated that a distinguishing characteristic was that “All management science method(ologies) … share the idea of developing models (representations) of aspects of the situation.” The models can be “mathematical, computer-based, logical, diagrammatic, or linguistic.” (p. 561). I agree that the use of models is central to O.R. The main aim of this research is to develop a model to explain the relationships within the system in question.

In this respect, this research can be classified as Operational Research. It is concerned with developing and exploring models – linguistic, diagrammatic and mathematical, in order to provide information to improve a problem situation. It begins by developing a linguistic model of the nature and purpose of the service to the learners with vision impairment. A performance measure is identified – opportunity-to-learn or access to the curriculum. Diagrammatic models are developed from the literature that explore and clarify the elements of opportunity-to-learn and its precursors and dependants. Statistical modelling and index development are used to create an instrument that can measure opportunity-to-learn. Its usefulness is examined by analysis of data from the regular population. Then quantitative data regarding learners with vision impairment is used to build statistical models that aim to inform decision makers.

This thesis illustrates a pluralist paradigm, by using qualitative research, comprising interviews and a case study analysis, alongside quantitative analysis, using index development and statistical analysis of “hard” data about individual children.

The Educational Evaluation Approach: Mixed methods

In the area of Educational Evaluation, there is a move towards mixed methods, which draw on the strengths of both qualitative and quantitative methods of enquiry. This comes from a practical need, similar to that of Operational Research, to capture the full picture in an evaluation, in a way that is richer than that which either the quantitative or qualitative paradigm can accomplish individually. Like Operational Research, it also has been influenced by "the challenges to conventional scientific wisdom raised by philosophers of science and theorists of methodology." (Greene & McClintock, 1991, p.13)

In the chapter on program evaluation in the foundation text, "Handbook of Qualitative Research", Greene (1994) discusses the contexts and roles of evaluation. She identifies four major genres of evaluation methodologies with their corresponding philosophical frameworks, post-positivism, pragmatism, interpretivism and critical, normative science. This research aligns with the second genre, pragmatism, which promotes practicality, control and utility. Greene states that this genre arose as a result of "the failure of experimental science to provide timely and useful information for program decision making." (p. 532) The following description of the pragmatic genre is descriptive of the research undertaken here.

> Characteristic of these methodologies are their orientation to decision making and hence to management, their primary emphasis on producing useful information, their practical and pragmatic value base, and their eclectic methodological stance. Evaluators in this genre pragmatically select their methods to match the practical problem at hand, rather than as dictated by some abstract set of philosophical tenets. (Greene, 1994, p.533)

The work in educational evaluation by Patton (2002) encourages a pragmatic approach. Patton believes the issue is about making sensible decisions about methods, depending on the nature and purpose of the inquiry. He expresses his aims as follows:

> My pragmatic stance aims to supersede one-sided paradigm allegiance by increasing the concrete and practical methodological options available to researchers and evaluators. Such pragmatism means judging the quality of a study by its intended purposes, available resources, procedures followed, and results obtained, all within a particular context and for a specific audience. (p. 71).

Miles & Huberman (1994), in their sourcebook for qualitative data analysis discuss the links between qualitative and quantitative data. They describe how a qualitative focus can help in a quantitative study thus:

> Qualitative data can help the quantitative side of a study during *design* by aiding with conceptual development and instrumentation. They can help during *data collection* by making access and data collection easier. During *analysis* they can help by validating, interpreting, clarifying and illustrating quantitative findings as well as through strengthening and revising theory." (p. 41)

The qualitative data in this research was used in design by helping to define the problem, it aided in data collection by identifying what data was needed and from whom, and in the analysis, the insights from the preliminary study were used to help make sense of the quantitative findings.

In essence this research followed a two-phase developmental approach wherein the first method (qualitative inquiry predominantly using interviews) was used sequentially to help inform the second method (quantitative data collection and analysis), as defined by Greene, Caracelli, & Graham (1989). The pragmatic and somewhat aphilosophical approach is similar to that proposed by Patton (2002) and congruent with much Operational Research thinking.

1.4 Evolution of the Research Questions and Boundaries

Research questions

The original research questions at the outset of the research were as follows:

What factors affect the needs of a learner with vision impairment?
What are valid criteria for determining categories of learners with vision impairment?
What are the desired outcomes for a particular category of learners with vision impairment?
What are the resource needs for a particular category of learners with vision impairment?
What is the relationship between the quality of match between needs and resources, and the educational outcomes?

As the focus of the work changed, so did the research questions. They grew to include:

How can the perceptions of students be used in assessing the effectiveness of their education?
Are learners with vision impairment receiving access to the curriculum equivalent to that of their sighted peers?
What are the strengths and weaknesses of the service provision for learners with vision impairment in mainstream secondary education?

Boundary definitions

Whenever a system is studied, part of defining the system is deciding where the boundaries of the study lie. Originally the boundaries were as described in Table 1.

Table 1. Original boundaries of the study

	Included	Excluded
People	Students with vision impairment between the ages of 0 and 21. Resource Teachers: Vision Parents	Students with no identified special needs Students with other disabilities who are not visually impaired Mainstream teachers
Processes	All services funded by the Ministry of Education The amount of time spent by various people	Services funded by charity or the Ministry of Health The teaching methods employed Equipment provided
Location	All of New Zealand	Other countries

Like the research questions the boundaries changed as the research progressed. The decision was made to focus on students in their first three years of secondary school and to broaden the range of people consulted to include mainstream teachers. Regular students were included in part of the study to provide a baseline to measure the learners with vision impairment against. The resulting boundaries are given in Table 2.

Table 2. Revised boundaries of the study

	Included	Excluded
People	Students with vision impairment in a mainstream secondary school setting in Years 9,10 and 11. Regular students in Years 9,10 and 11 Resource Teachers: Vision Parents Mainstream teachers	Students with other disabilities who are not visually impaired Students with vision impairment not in a mainstream setting Students with vision impairment not in Years 9,10 and 11.
Processes	All services funded by the Ministry of Education The amount of time spent by various people	Services funded by charity or the Ministry of Health The teaching methods employed Equipment provided
Location	All of New Zealand	Other countries

Chapter 2:

Preliminary Research

This section describes the work undertaken in 1999 and 2000 to gain a clear picture of the problem situation and inform the decision regarding what data would need to be collected in the quantitative part of the research. It builds on the background information on the education of learners with vision impairment described in Section 1.2. It also draws on literature in the area of Vision Impairment and Blindness current at the time and more recent literature. The results of this phase motivated the development of an instrument to measure opportunity-to-learn and informed the choice of data collected in the quantitative study.

2.1 Research questions

An important part of the Operational Research process is to understand and summarise the problem situation, identify the problem for analysis and describe the relevant system, thus clearly defining the scope of the problem before any major analysis or modelling is undertaken. (Daellenbach & McNickle, 2005). It is also important to involve stakeholders in the research from the beginning, in order to encourage "ownership" of the method and results, and implementation of any recommendations. One purpose of this preliminary research was to involve stakeholders in summarising the problem situation, in preparation for the quantitative data collection and analysis. The initial qualitative phase was needed to ensure that the later quantitative data collected was as comprehensive as possible.

At this stage of the process the intention was eventually to collect quantitative data on all the learners with vision impairment and use it to develop models which would inform caseload and resource allocation. For this reason the interview questions related to all learners with vision impairment. The

study was later narrowed to focus on secondary school students, partly as a result of the findings from this inquiry.

The research questions for this phase of the study were:

What is the purpose of the service provided by the RTVs?

What are the desired outcomes for learners with vision impairment?

What factors may potentially affect the needs of a learner with vision impairment?

What are potential criteria for determining categories of learners with vision impairment?

How do stakeholders feel about the use of categories of learners with vision impairment?

Are all learners with vision impairment with similar levels of need receiving the equivalent level of service?

2.2 Method

The approach of semi-structured interviews, transcribed and analysed using textual analysis, was chosen for several reasons. Firstly, the area of study, learners with vision impairment in New Zealand, is not well researched. The collective wisdom and experience resides in a small number of individuals, which has not been documented, particularly in the area of resource needs. Expert interviews, followed by questionnaires to some stakeholders, were considered to be a powerful way to draw on the resources available and elicit the required information. Secondly, following accepted principles in Operational Research, the participation of the stakeholders in the development of the model should increase the likelihood of its being successfully implemented and accepted.

This method could also be described in Operational Research terminology as an iterative process of interviews and analysis, aiming to define the problem rigorously before attempting to "solve" it. However there were gains, at a philosophical level, by using established methods from the qualitative research literature, particularly in the area of Educational Evaluation.

The philosophy underlying the use of mixed methods was discussed in Section 1.3.

Data collection

As is usual in the Health and Education Sectors, there are many stakeholders with interest in the problem. These include the learners with vision impairment and their families and whanau, RTVs, the

regular class teachers, teacher aides, other specialists, fund-holders such as Group Special Education, the Ministry of Education, the Royal New Zealand Foundation of the Blind, Parents of Vision Impaired Inc, other learners with different disabilities (with whom the learners with vision impairment are competing for funding), and other specialists within the area of education of learners with vision impairment. As RTVs work the most closely with the individual students and have the most experience and expertise in teaching learners with vision impairment, their opinion was sought first. Parents and classroom teachers were consulted subsequently.

A purposive sampling method was used. Eight "Resource Teachers: Vision" (RTVs) were selected who had extensive experience, including overseas. One interview was conducted with each RTV. Six RTVs worked in larger visual resource centres (more than two teachers) and two were from small centres. Some were in supervisory roles, and some worked directly with the children. Most of the teachers interviewed had over ten years experience in the field, with some having over twenty years. The RTVs included those who worked with high school children, primary school children, pre-school children and children with multiple impairments. The caseloads of the different RTVs varied considerably. Of the eight RTVs interviewed, seven were women. (To maintain the man's confidentiality, feminine pronouns are used to refer to all RTVs.) There are very few (about three out of forty) male RTVs in New Zealand, so this gender imbalance reflects the nature of the population.

As the object of the interviews was to seek non-sensitive factual information by interviewing professional people in the areas of their duties and competence, this part of the research was exempt from review and approval by the University of Canterbury Human Ethics Committee. I confirmed verbally with the Chairman of the committee that this was the case. To ensure that the research complied with the Human Ethics Committee guidelines, I sent information sheets (see Appendix 3) to the teachers informing them about the use of the data, and asking them to use pseudonyms rather than refer to individual students. Where names, places or other identifying features did appear in the transcripts, they were changed in order to protect anonymity.

The interviews were conducted over a period of four months. They lasted between one and two hours and most were held in the visual resource centres. At most two interviews were conducted in one day. The interviews were semi-structured and were tape-recorded with the permission of the participants. The full set of interview questions is included in Appendix 4. The questions provided a structure to the interview, but the subjects were encouraged to elaborate as much as they wished. Brief notes were taken during the interviews, partly to help follow up ideas that came up as part of the process. The teachers perceived me as a fellow professional rather than as a parent of a blind child. One commented at the end of the interview that she had forgotten I had a blind son. After seven or eight interviews it

became apparent that there were no new themes or ideas arising, and data collection by interview was halted. After the interviews were analysed, further data was collected by eliciting responses to an initial discussion document.

Data analysis

The interviews were taped and transcribed, three personally and five by a secretarial service. The transcriptions were checked against the tapes as some of the specialised terms were mis-transcribed, sometimes giving the opposite meaning to what was intended. I also added notes to the transcription regarding the atmosphere and general ideas to come out of the interview. The full transcript for one of the interviews was not available due to a technical problem.

The package NUD*IST4 was used to store the text and provide a tool for coding the data and finding meaning. A line of 72 characters was used as a text unit. I chose to code the last interview first, as it was a more succinct interview and I wanted to deal with the coding issues, and learning a new package while dealing with an interview that would be straightforward. Before starting the coding, I pondered each of the questions and wrote overall impressions which had been gained during the interviews and while transcribing and checking the interviews.

As there was a structure to the interviews, and there were specific questions I wanted answered, these provided the starting points for the codes. The original codes, before starting, were based on the main questions: Determinants of need, Categories, Purpose and Outcomes. As I proceeded through the coding I added subcodes, and also two other main codes, Service – to describe the service provided at present, and specifically the role of the VRT, and another code, NZ_Curr, which relates to the specific question of access to the NZ curriculum. I found it easiest initially to code on paper, then transfer to the computer package, creating new codes as needed.

The coding process followed very closely that described by Miles & Huberman, (1994) in “Chapter 4: Early steps in analysis”. A code is a label that assigns a category of meaning to a piece of text. Codes can be linked into a tree structure, as sub-ideas provide branches. For example the piece of text:

> “the children who get the most are the braille children”

was originally coded as /Determinants of need/ Braille. At the end of coding and analysis, this code had been formed into a branch structure and was now listed as /Determinants of need/ Nature of the child/ Level of functional vision/ Braille. Rather than listing all of the potential determinants of need individually, these were grouped together into clusters or categories.

Often the coding was straightforward, with the responses corresponding to the questions that preceded them. However ideas and themes appeared within answers to different questions, especially with regard to the purpose of the service. An example is the following the text unit from an RTV:

> We are constantly trying to keep that gap as minimal as possible. Because even by pulling them out of class we're causing a gap.

This was part of a response to a question on the determinants of need, following up a comment on the impact of the child's cognitive ability. It was coded in two ways – "Why it is necessary to have the service" and "Equal opportunity with their peers", and as part of a larger text block it was coded as "Good academic results" and "RTV teaching an individual child".

After coding two interviews I discussed the coding with a supervisor who has experience in qualitative research. He indicated that the list of codes was fairly mechanical, taking the responses mostly at face-value. As the purpose of the interviews was mainly to elicit opinion and information from "experts", this was acceptable. He also indicated that some leading questions in the interviews were encouraging short answers.

After completing the initial coding of the eight interviews I examined the tree structure and where branches had many nodes, I regrouped them into smaller categories (called clustering). Where ideas could be conceptualised as subgroups of other ideas, these became branches. The tree structure in full is reproduced in Appendix 5 and a section is shown in Figure 1. Text units were grouped at each of the code levels, not just the lowest level. The tree structure was used for writing the themes and ideas from the eight interviews into an initial report/discussion document. The document set out the main responses to each of the research questions, with illustrative direct quotes. It did not include reference to research literature.

The discussion document was distributed for comment to all forty RTVs in New Zealand. Each RTV was also sent an additional copy of the report to be given to either a mainstream teacher or a parent for comment, as they felt most appropriate. Reports were also sent to members of the National Committee of the Parents of Vision Impaired (ten parents with children with vision impairments). The reports were accompanied by response forms to help give structure to the feedback. In total ninety reports and response forms were distributed and comments were received from fourteen RTVs (four of whom had previously been interviewed), three parents and three mainstream teachers. This reporting stage was used to inform stakeholders as to the progress of the research and to give them an opportunity to have input into the process. A response was requested from an expert in the field, who questioned some of the themes and ideas, and particularly the effect of current under-funding on the expectations of the

RTVs who had been interviewed. Her opinions were also incorporated into the report and are discussed later.

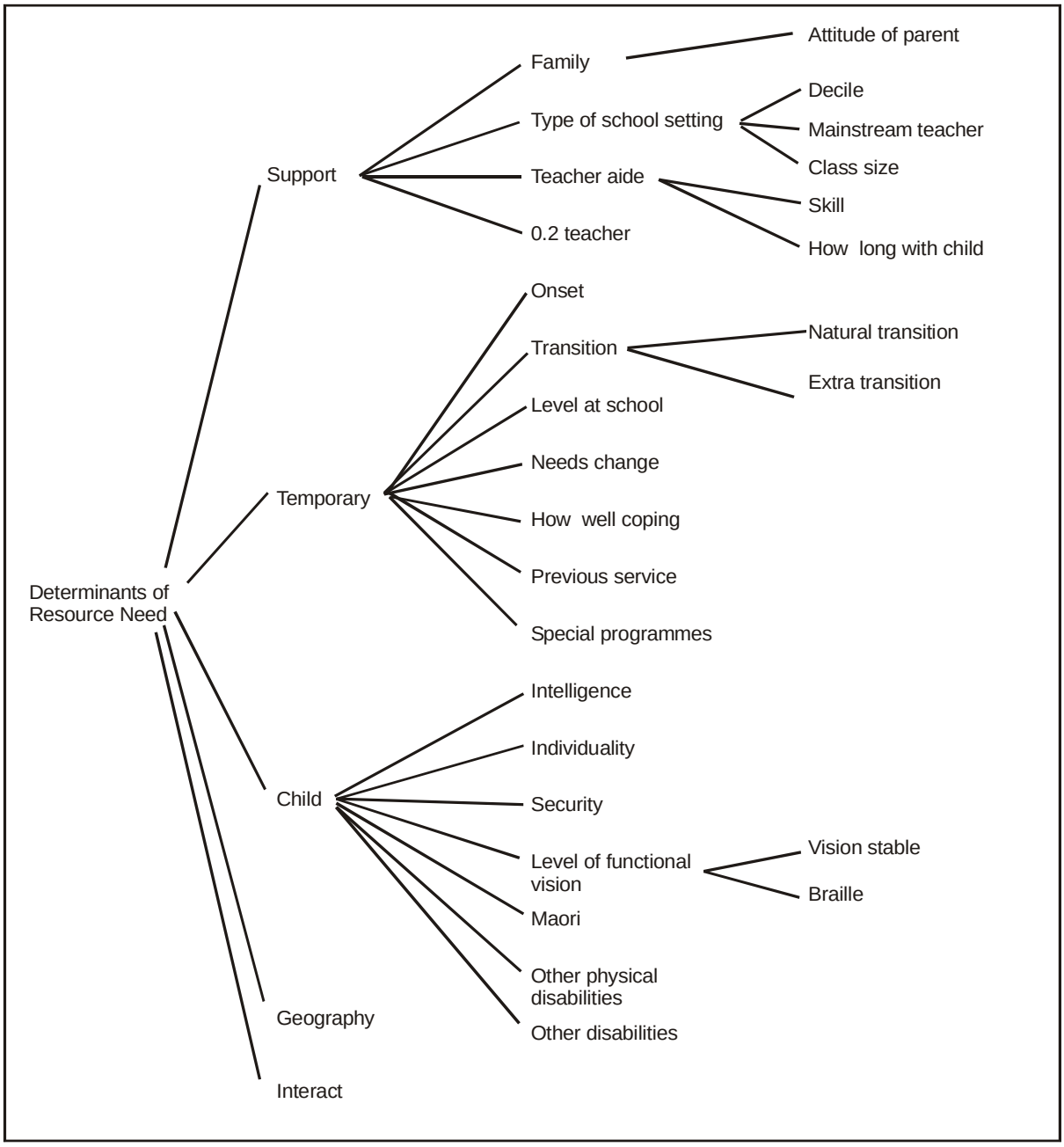


Figure 1. Codes related to Determinants of Resource Need

The responses to the report were transcribed for analysis. The responses expressed general agreement with the initial report, and some new suggestions. The additional data were analyzed in a similar manner to the original interview data, additional material added to the report, and alterations made. References to the research literature were added at this point. This was presented at the 2001 Biennial

Conference of South Pacific Educators of Vision Impaired (Petty, 2001). Presenting to this group of stakeholders was another way of keeping connected with the environment for the problem. It also provided validation on the themes that had arisen from the data.

Many of the interview questions related to determining the level of resource teacher time required. However as the research progressed, a different focus emerged, that of access to the curriculum. The study reports circumstances and decisions as they were perceived by RTVs and other stakeholders in the field at the time. It may not be how things **ought** to be, but reflects current practice and attitudes in New Zealand at the time of the study (1999/2000).

2.3 Results

This section summarises the results of the inquiry phase. Accompanying the results from the data collection are references to the literature on Vision Impairment and Blindness which reinforce or conflict with the themes in the data. The literature cited is mostly contained in the Journal of Vision Impairment and Blindness, which is the main publication for this research. This use of literature is described by Creswell (1994 p. 23) as providing "a basis for comparing and contrasting findings of the qualitative study." He comments that "this approach is most suitable for the 'inductive' process of qualitative research." It is most common in grounded theory. The research literature can be treated as another source of data. Sometimes the articles are taken at face-value, but the underlying beliefs displayed about the purpose of services for learners with vision impairment also provided support and depth to the findings from the field.

The intention of this chapter is not to give a full description of the service provided to learners with vision impairment in New Zealand. This is given briefly in Section 1.2 of this thesis, and a thorough presentation can be found in Kelley & Gale (1998). Rather, these results address the research questions, regarding the purpose of the service, outcome measures, potential determinants of need, and attitudes to categorisation.

A major purpose of this qualitative inquiry was to provide information to identify data to collect later. A description of how the results informed the later stages of the research is given at the end of each sub-section.

2.3.1 Purpose of the service

Before measuring whether the provision for learners with vision impairment is accomplishing its purpose, it is necessary to define the perceived purpose of that provision. The research questions relating to this were:

What is the purpose of the service? What are the desired outcomes for learners with vision impairment?

The questions to the RTVs included, “If we look at resource provision – itinerant teacher, teacher’s aide etc as one package, what do you see as the purpose of all this for the children?”, ”Some people might see the level of resource provision for these children as very expensive. How would you respond to that?” and “What are you trying to accomplish with the children you work with?” These questions aimed to provoke something other than the “standard” answer as suggested in Kvale (1996).

The themes emerging from the responses can be grouped into the categories of long-term objectives for the students, students’ current quality of life, and the ideological reasons for providing a service. Another emerging theme was of access to the curriculum.

Purpose of the service: Long-term objectives for the students

The interviewees and other respondents had in mind a future for the learners with vision impairment. This vision of the future included happiness, personal fulfilment, being part of the community of their choice, being as independent as they can, having a social life, and achieving their individual potential.

> I think probably what we’re trying to accomplish is that the child, each individual will have the opportunity to be a happy, well educated, useful member of society. (RTV)
>
> So they can reach their potential and not be in any way disadvantaged because they are vision impaired. (RTV)

Long-term goals included appropriate tertiary education, employment and contributing, being part of a community and “…that they lead lives that are satisfying and fulfilling for them…” (RTV)

> To ensure … that their learning potential is maximised. Not just learning in the narrow sense of academics, in the most broad sense of being able to be a social, emotional, contributing member of society. (RTV)

The role of education in preparing learners with vision impairment for the future is emphasised in the study by Oddo & Sitlington (2002) into the adult life of graduates of a school for individuals with vision impairment. They stated that "the goal of education for all students should be preparation for adult life," (p. 850) and that "there is a critical need for continued interventions and curriculum that prepare students with visual impairments for adult life." (p.842) Wolffe & Sacks (1997) in the introduction to their study of the lifestyles of blind and low vision youths, stated that educators needed to understand what life activities and social skills are critical "so they may assist these youths to make successful transitions from school programs to adult responsibilities and roles." (p. 245)

The aspect of participation in society is particularly relevant with respect to the use of technology. Kapperman, Sticken, & Heinze (2002) state that most experts "agree that assistive technology is essential for visually impaired individuals to be **full participants** in a technological society." (p. 106, emphasis added). In their paper on placement decisions and the unique educational needs of learners with vision impairment, Curry & Hatlen (1988) conclude with the desire that a student "will be prepared for full participation as an adult in our society."(p.424)

Realizing potential is a theme that also recurs in the literature. Bishop (1990) examined the placement decision for a child with vision impairment, and looked for the "best opportunities for the visually handicapped student to realize his or her potential." (p. 352) Chalifoux & Fagan (1997), who discussed whether children who are visually impaired should be labelled as "disadvantaged", closed with the statement, "Only by breaking this cycle of disadvantage can children with visual impairments reach their full potential in all areas of development."(p. 537) Head (1990), while examining the appropriateness of "educational deficit" as a service criterion stated that the purpose of education was "helping the individual perform at his/her highest potential."(p. 207)

Purpose of the service: More immediate goals

As well as the long-term global picture of independence, participation and happiness, other more immediate goals were identified. These included current independence, participation and happiness, concept development, access to the New Zealand curriculum, academic achievement and facilitating learners' choice.

> A normalised visually impaired kid is one with plenty of friends like any other children. (RTV)

> We really encourage independence and appropriate assertiveness so then children can advocate for themselves. (RTV)

It was emphasised that the development of concepts for learners with vision impairment, and especially for learners who are blind, is severely hampered by their visual deficit. A purpose of the service is to compensate as much as possible for this deficit, and try to facilitate good concept development.

The idea of allowing for choice was expressed by this teacher:

> I suppose what you are trying to do is have everything wide open for them for choice. Instead of saying to them “oh, you can only do that”, and “that subject choice is because you are vision impaired” we want to say “that’s your choice, now it is our problem to work out how you can actually access that.” (RTV)

Many of the respondents clearly thought that the learners with vision impairment should have all the resources they need to gain full access to the curriculum.

> I think what we are trying to do, it comes back to that equity, is to allow them to be educated in the setting of their choice alongside their sighted peers and to have access to things that make that possible. So they can reach their potential and not be in any way disadvantaged because they are vision impaired. (RTV)

Purpose of the service: Ideological justification

The rationale for the service was vehemently expressed by one RTV:

> If we look at ourselves as a civilized society then we’ve got to look after (in the total sense of the word) the people, the children, who have been born with this, that, or the next thing, and we can’t count the cost. Because otherwise we’re not really a civilized people are we? (RTV)

This relates to the idea in some literature of what learners with vision impairment “deserve”. Curry & Hatlen, (1988) state that the “visually impaired students deserve the same instruction in reading, mathematics, social studies, science, language arts etc that seeing peers receive,” (p. 418) and conclude that “visually impaired students deserve to be educated in a placement that meets all their educational needs.” (p. 424) In McLinden's (1990) survey of beliefs about effective education among teachers of visually impaired children, the belief that “every visually impaired child has the right to an education, no matter what the cost” (p. 467)is ranked as number two of the personal/professional beliefs.

A comment from a parent combined the concepts of deserving and of opportunity:

> …give the child every opportunity to learn the same as sighted children. (A) principal must believe that (the) child deserves every opportunity. (Parent)

One RTV also brought up an economic aspect:

> The more we can put in early the less it is going to cost the country later on. (RTV)

In a commentary in the Journal of Vision Impairment and Blindness, Phil Hatlen, a prominent educator and researcher, linked independence and equality, expressing his opinion that equality for people with disabilities follows on from equality for women and ethnic minorities. He emphasised that fostering independence was an important part of enabling equality (Hatlen, 2002). His earlier seminal document outlining the core curriculum for blind and visually impaired students talked about the impact in the future, and included the issues of rights and opportunities:

> For blind and visually impaired people, accomplishments and joys such as shopping, dining, attending and participating in recreational activities are a **right**, not a privilege. Responsibilities such as banking, taking care of health needs, and using public and private services are a **part of a full life** for everyone, including those who are blind or visually impaired. Adopting and implementing a core curriculum… will assure students of the **opportunity** to function well and completely in the general community. (Hatlen, 1996, p. 30) (emphasis added)

Purpose of the service: Access to the curriculum

A theme that emerged from the interviews was that of having access to the New Zealand curriculum. (This is referred to as the "national curriculum" by participants.) This could also be categorised as the "intended curriculum" which guides the teachers in presenting the "implemented" curriculum (Martin & Kelly, 1997). Reference to the outlining document, the "New Zealand Curriculum Framework", tells us that:

> The New Zealand Curriculum provides all students with equal educational opportunities. The school curriculum will recognise, respect, and respond to the educational needs, experiences, interests and values of all students…students with different abilities and disabilities…Inequalities will be recognised and addressed. All programmes will be … non-discriminatory, to help ensure that learning opportunities are not restricted. (Ministry of Education, 1993, p. 7)

The National Plan for the Education of Learners who are Blind and Vision Impaired in Aoteroa/New Zealand provides a baseline for the discussion of educational needs of learners with vision impairment. The document itself states:

> The National Plan is based on the philosophical position that learners who are blind and vision impaired have unique needs but the same rights and requirements to receive the education available to their sighted peers. If they are to receive the education that is their right, additional resourcing will be essential.
>
> The philosophy underpinning the education of learners who are blind and vision impaired is the same as that for all education: that every person has the right to a complete and satisfying life as a fully participating member of society. Within the school setting this may be interpreted as the right to equal opportunity and equal access to all parts of the educational programmes, both curricular and extra-curricular. (Nagel & Wells, 1998, p. 2)

One of the RTVs put it this way:

> …a child cannot see, they need to access the curriculum. So they need a modification to allow them to access that, to have a right to an education. The same as everybody else. (RTV)

We can observe here the theme of equity – "the same as everybody else". The reason given for providing the resources is to enable the learner to have equal access to the New Zealand curriculum. This idea of using the curriculum to make up for the effects of the disability is illustrated in this quote from the conclusion of a paper on the benefits of and barriers to computer use for individuals who are visually impaired.

> Because the potential exists for computers to **balance** some of the effects of visual impairment and give visually impaired individuals **equal opportunity** to achieve in productive ways with sighted individuals, "getting wired" should be an integral part of the so-called core curriculum for children. (Gerber, 2003, p. 549) (emphasis added)

The RTVs were strong in their belief that nearly all aspects of the curriculum should be available to the learners, given the necessary resources and adaptations. One RTV expressed her confidence in their ability when she said, "I think there is very little that they cannot do." This is borne out by Erin, Corn, & Wolffe (1993) whose study of learning and study strategies "reaffirms the notion that students with visual disabilities are capable of competing academically with their sighted peers."(p. 267)

The idea of the dual or "expanded core curriculum" as proposed by Hatlen (1996) has been adopted among resource teachers in New Zealand. This curriculum specifies the unique learning objectives for learners with vision impairment. The RTVs considered one of their chief roles to be the delivery of the expanded core curriculum, as the ones suitably qualified for this. One expressed it as follows:

> Because basically it's assistive technology, it's Orientation and Mobility, it's social skills, it's techniques of daily living, it's literacy. It's those areas. And we consider it the curriculum that the classroom teacher would not begin to deliver because they don't know it exists perhaps. And too individual. No one else in that class needs it. If I don't deliver it, that child really is missing out. (RTV)

Head (1990) expresses his concern that if academic learning is considered the only reason for the provision of the service, then many children who are achieving academically will miss out on the important other skills needed by learners with vision impairment.

As a result of this analysis, the purpose of the service can be summed up as providing students with the opportunity to learn, equal to their peers, in order to develop their individual potential to become independent adults, participating in society. The outcome measures chosen for the study reflected aspects of this.

2.3.2 Outcomes and potential outcome measures

Caseload modelling and caseload allocation in this area assumes certain numbers of hours for certain types of disability with regard to service provision. These numbers may well be valid, but are not based on evidence from empirical research. An aim of this research was to explore the relationship between resource provision and outcomes and, if possible, provide an indication of the level of resources needed by different students in order to achieve certain levels of outcome. Thus an outcome measure was needed.

The questions and prompts to the teachers with regard to this were as follows:

"I would like to identify some measurable outcomes for use in my research. Can you suggest any? How does a child with vision impairment get access to the New Zealand curriculum ? What are your thoughts on estimating how much access a child has to the New Zealand Curriculum? To the expanded core curriculum? Would you be able to estimate the level of access your children have to specific aspects of the New Zealand Curriculum? How about the access they should be able to have? Can you think of ways to do this?"

In response, one suggested outcome measure was the achievement of goals set in the Individual Education Plan (IEP). This would be valid for those children who have an IEP, which is about half of the target population, albeit the half with the greater needs. The variability between IEPs would be an issue, and there might be a tendency in the long run towards perverse incentives – either setting goals that are too easy in order to appear to be achieving or setting them unrealistically difficult so that more resources might be made available.

Other potentially measurable outcomes include examination and school results, and achievement within the expanded core curriculum. Standards and testing within the Expanded Core Curriculum are still being developed. PAT scores (Progressive Achievement Tests, used to test the whole school population), were not accepted by the RTVs or the Ministry of Education as valid for learners with vision impairment. A measure of the social development and happiness was considered desirable, bearing in mind the issues emerging from the discussion of the purpose of the service.

The identification of the desire and responsibility for all children to have access to the New Zealand curriculum led to the idea of measuring the level of this access. This idea was explained to the RTVs and met with cautious acceptance. Concerns were expressed about the subjectivity of the measure - that it might differ even for one child, depending on who was measuring it. This could be the RTV, the mainstream teacher, the parent or the learner. For some students it was suggested that their response would depend on what had happened that day, rather than giving a long-term view. It was also pointed out that

> There is a need for both short and longer-term views – the perspectives can be triangulated to provide a depth of understanding. After all, a day is part of the longer term. There can be too many “untypical” days for some learners with special education needs. (RTV)

Bearing in mind that customer satisfaction could be viewed as an outcome, the teachers were asked who they identified as the customer. Answers included the child, the parents and the mainstream teachers, in that order of importance and focus. Some Visual Resource Centres have administered parent satisfaction surveys, and differed in how useful they found the exercise. It was suggested that it might be better for an independent body to perform the survey. The response rates for satisfaction surveys among mainstream teachers were not high. The implication is that a measure of customer satisfaction might be useful, depending on who is asked and how they are asked.

In summary, the potential outcome measures included a measure of satisfaction by the child, parent and/or mainstream teacher, a measure of achievement of IEP goals, an indicator of progress (especially for those with multiple impairments), measures of access to each part of the New Zealand

curriculum, a measure of happiness or self esteem, academic achievement, and achievement in the expanded core curriculum. Other suggestions include choice of curriculum areas, access to recreation, daily living skills. These suggestions led to the decision to create an instrument to measure opportunity-to-learn the New Zealand (or intended) curriculum. This formed the second phase of this research.

2.3.3 Determinants of need

One of the key aims of the preliminary study was to uncover the possible factors that could affect a learner's level of need for services. This would be used to try to ensure that the data collected was as comprehensive as possible. As an aim of the research as a whole was to explore the best allocation of funds in order to gain effective results, it was important to find out the factors that might affect the level of resourcing or the level of outcome. This was asked both directly and indirectly, using the following questions: "You have several different children on your caseload, and have worked with different children over the years. When you decide or recommend the level of service and resources, what do you need to know? Might the same child need different levels of service at different times or stages? At what times would they need more? What factors do you think are the most important or have the most impact? The least important? Why does one child do better than another? "

Several themes emerged from the responses. It was clear that the issue was very much related to each individual child. The themes could be grouped into aspects of the learner, aspects of the current support and aspects that are time-related, as shown in Figure 1. Respondents also suggested that the different factors interact in their effect on the level of need. At the time of the interviews (1999, 2000) Special Education 2000 had only been introduced recently when the ORRS funding system was implemented in 1998. Thus the influence of the SE2000 categories on resource decisions was not as great as it might be several years later when the categories have become established.

There was a very strong indication that these decisions are individual – that it is difficult to give general answers. This is reflected in literature on programmes for learners with vision impairment. Koenig & Holbrook (2000) consulted 40 professionals on levels of service in areas of braille literacy. Even within this seemingly homogenous group of students, the conclusion was still that the recommendations "must be tailored to address the identified individual needs of each student." (p. 693) Early work on assessing functional vision in people with low vision also emphasised that the nature of the individual was a large factor in how well they were able to make use of what vision they had. (Corn, 1983)

Table 3 summarizes the categories with regard to determinants of need that emerged from the data.

Table 3. Themes regarding determinants of need

Learner	Level of vision – functional Other disabilities Nature of the individual
Current support	Family Educational setting Attitude, competence of Regular Education Teacher Teacher aide
Time dependent	Transition times – natural, extra Primary/Secondary School

Respondents also suggested that the different factors interact in their effect on the level of need.

> Complex interactions between vision, other disabilities, and other service providers make this a case-by-case consideration. (RTV)
>
> (There is a) multiplicity of impact when more than one disability is present (e.g. a learner with a number of what individually may be described as moderate needs may result in a learner with high needs).” (RTV – written response)

Determinants of need related to the individual learner

Many elements of the learner’s make-up will influence the level of service needed. A key determinant is level of vision, incorporating whether the learner uses braille or print. Other disabilities may impact on resource need, as may the learner’s other individual qualities such as personality, determination, intelligence and feelings of security. It is important to view the learner as a whole. This was consistent with Bishop (1986) who found that over half the factors which were thought to relate to success in mainstreaming relate to the individual pupil.

Individual Learner: Level of vision

It was clear that braille users require a different (and higher) level of input than print users. However it was not clear whether for print users the level of vision was important in terms of determining the desired level of service from the RTV, and if so, whether this reflected the actual level of need, or simply a lack of resources.

> Because we have not got the staffing that we'd wish, I have to say that the kids who are at the very top end of the visual criteria for us 6/18-6/24 kids would get less frequent visits than the child that is 6/36-6/60. [1](RTV)

> "I believe the level of vision for print users is extremely important in determining the level of service required – can they access the task-board? What level of enlargement of print is required, what equipment is in place? e.g. CCTV, hand-held magnifiers, monocular etc." [2](RTV)

It was pointed out, and reinforced that the manner with which the residual vision is used, called "functional vision" is more important in educational terms than the clinical assessment of vision.

> Two children with the same acuity can be functioning quite differently. (RTV)

> I strongly agree that two learners with the same level of acuity may be functioning quite differently. It is the level of functional vision that is significant. (Expert)

Other aspects of the vision impairment can change the level of need. These aspects include the time of onset, field of vision, if the level of vision is changing, rather than stable, and whether the impairment is congenital or adventitious.

The total level of a child's disability (related to vision and otherwise) would affect the level of total support, including the provision of education support staff, equipment and other specialist input, particularly for learners with complex inter-related needs. However it was clear that the RTVs perceived that the level of vision-impairment rather than the total level of disability was the important element in determining the level of service provided by the RTVs themselves.

It was decided to collect data on whether the child is blind or not and uses or could use braille, print, a combination or another mode of communication such as signing. Though it would be preferable to use a measure of functional vision, only the broad categorisations were available.

[1] 6/18-6/24 is better vision than 6/36–6/60. The numbers refer to what can be seen at certain distances. A person with 6/60 can see at 6 metres what a person with normal vision can see at 60 metres.

[2] CCTV is Closed Circuit Television. This is sometimes used by students with low vision.

Individual Learner: Other disabilities

Physical and other disabilities also affect the total level of need, though the existence of disabilities not related to vision can sometimes lead to a lower provision of vision-specific service, in response to the educational setting chosen for the learner, and the support provided by other agencies. The comment from an interviewee:

> If I thought their vision was a minimal part of their difficulties then we give them kind of a minimal amount of service. (RTV)

prompted a later comment:

> It may perhaps more reflect the limited resources available than a professional philosophical perspective. (Expert)

This conflict of the ideal as opposed to the real is apparent throughout the results of the study. The RTVs express what they believe should be happening, while knowing that it is often not happening in practice. Conversely, they also discussed what is current practice, knowing that it is sometimes less than ideal.

Some physical disabilities, such as cerebral palsy, will inhibit the ability of the learner to use braille, if that is the otherwise preferred medium. It is not clear whether this would affect the level of service needed and provided. Learners who are deaf-blind have a very high level of need, and services are provided within the Vision Education setting. Deaf-blind learners who were educated in a mainstream setting were included in the later data collection.

Thirty to forty percent of the learners with vision impairment in New Zealand are known to have additional special needs. The data collected subsequently recorded what other disabilities are present, and to what extent. The decision was made to limit this body of research to those students who were being educated in a mainstream setting. This reduced the proportion of students within the sample who had multiple disabilities, as students with multiple disabilities are often educated in special units or special schools rather than in a mainstream setting.

Individual Learner: Characteristics of the individual

Just as the individual nature of all children affects their learning, the nature of the individual child with vision impairment is thought to affect the required level of service. The term “individuality” is used by Corn, (1989) to comprise cognition, sensory development integration, perception, psychological make-

up and physical make-up. It describes elements that influence the level of visual function in a particular instance or individual. In this research the characteristics of the individual include personality, motivation, intelligence and social skills. These are all characteristics which influence learning in the general (sighted) population. These characteristics could have a similar, diminished or amplified effect in the case of learners with vision impairment.

Level of intelligence was suggested almost reluctantly by the respondents as a determinant of the level of services required, and the description of the effect of intelligence differed between respondents. Opinion was divided over whether a bright child was better able to cope, and thus needed less support, or that a bright child had a greater potential to keep up with his or her sighted peers and thus needed more input to enable this to happen. It is interesting that Bishop (1986) also received mixed responses to statements regarding the relationship between intelligence and success in mainstreaming. Head (1990) stated that "Intellectual prowess in school does not dictate, nor should it direct, the provision of compensatory instruction."(p. 208) He was specifically referring to the proposed practice at the time of using educational deficit as a determinant for service. Intelligent students who were performing at grade-level would thus be deprived of the services they needed in areas other than academic achievement. These areas are today called the Expanded Core Curriculum and include social skills, activities of daily living, Orientation and Mobility.

Aspects of a child's personality were mentioned by RTVs.

> …because they were bright and socially adept they didn't need much input at all.
>
> I think their attitude towards school in general and towards their learning is a big factor. Some children are far more motivated than others, as is true of all children.
>
> The nature of the individual should not affect need but it does! I think a bright child should not have less input than any other with the same need so they can reach their potential.

In the quantitative data collection the RTVs were asked to rate their individual students on each of the aspects – ability, motivation, social skills with adults and peers, and advocacy skills. In retrospect it might have been worthwhile to ask the students to rate themselves as well.

Determinants of need related to the current support or environment

Support for a learner with vision impairment includes support from the family, the school or setting, the mainstream teacher and the teacher aide. The levels of some of these are established in response to initial aspects of the learner such as the level of vision or other disability, and could be defined as

moderating variables. Each of these was thought to affect the level of service needed from the RTV, thus indicating the ability of the learner to gain access to the curriculum. This supports the assertion by (Bishop, 1990) that “even the most capable visually handicapped child may fail in the mainstreamed setting if that environment is not receptive, if there is insufficient special support, or if the child’s family is not interested, accepting and supportive.”

Current support: Family

Support from the family showed through as important in a variety of ways. The family, sometimes including the extended family, provide a good start to the learner. The level to which the family has come to terms with the disability has an impact on the family’s and hence the child’s ability to cope. An upset in the family can affect learning. Some parents attend meetings regarding the children (Individual Education Plan or IEP meetings). Some families, with the best intentions, can be very protective of a child to the extent that they stifle the development of independence. Other families are barely coping from day to day. An RTV summarised the importance of the family:

> …the students that are secure and achieving and having very satisfactory lives are the ones that have got a really sound family background, and it's not about money, it's about a supportive family that just treat them like a normal family member and don't allow any of the pressure stuff…they let them go and let them try to be as independent as possible, but really support them and I've just seen those children really blossom in that kind of background.”(RTV)

The pivotal role of the family, and the effect of family involvement was presented in the initial report and received varying response:

> Strongly agree with notion of family as central to the well-being of the learner. Also as an equal partner in the family-professional partnership – i.e., each are the holders of knowledge that collectively may be used for the benefit of the learner. I would suggest that a process be established whereby families themselves determine a measure. There are also cultural implications.
>
> I do not see family involvement as a measurable aspect. There is a risk of being very judgmental regarding family values of others. Do we “reward” families for attending IEPs by providing a higher level of support or “punish” families who don’t attend IEPs by reducing our support? I would not like to see “family” aspects factored in to levels of support required.

In the literature the quality of the home environment is considered fundamental to any child's success, though Head, Bradley, & Rock (1990) state that there are differences for children with impairments in their capacity to benefit from their environment, and the home environment may need to differ from that of non-impaired children.

Even though the level of support from the family is perceived to be an important element in the success of a child, it was difficult to imagine how it could be measured. It is unlikely to affect the level of funding, as expressed above, but because it affects the ability of the learner to have access to the New Zealand curriculum, it is relevant to measure it so that the impact can be studied and controlled for.

One possible surrogate measure of family support was thought to be whether the parent attends IEP (Individual Education Plan) meetings or not. It was suggested during the interviews that parents of about half of the learners do attend IEP meetings. The disadvantage of this measure is that it would apply only for the children who have IEPs. Some of the children who are not funded by the ongoing resourcing scheme do not have IEPs. (Up to half the population in some centres.) This information regarding attendance at IEP meetings was easily available and was incorporated in the data collection.

Other possibilities for measuring family support included the number of siblings, the place in the family, or a subjective measure provided by the visual resource teacher or the family itself. When the questionnaires were developed, the child, the parents and the RTV were all asked independently to rate the family as very involved, involved or not very involved in the child's education.

Current support: Educational Setting

The support provided in the educational setting was regarded as important, both with respect to quality and quantity. For children with additional special needs in special classes, the level of other support is high, so the input from the RTV would be mainly in an advisory role, rather than in directly teaching the child. The class sizes in special settings are much smaller.

> For students with complex interrelated needs in units an advisory role may be sufficient because the setting is generally more user friendly, staff understand special needs more and there is already a large number of specialists involved; SLT, OT, PT etc. (RTV)

However it was also pointed out that

> The limitation of the specialist Resource Teacher Vision to an advisory capacity only to learners with complex-interrelated needs appears one bound by level of resourcing. (Expert)

For a child in a mainstream class, the attitude of the classroom teacher and the principal were considered important to the learner's progress.

> The old story is that the attitude works from the principal down. That successful placements, I think, are often largely determined by the attitude that comes from the principal. (RTV)

> We've had examples of blind students that, it's just been a fairly miserable situation where there's a lot of negativity and things just aren't going well and if they move schools it just changes everything. (RTV)

> This goes for pre-school as well!! Hugely important that the principal and mainstream teacher are supportive – must be open to adapt their classroom and techniques to give the child every opportunity to learn the same as sighted children. The principal must believe that child deserves every opportunity. (Parent)

The attitude of the principal and teacher may or may not reflect the decile rating, or socio-economic background of the school. Whether a mainstream teacher has previous experience with a learner with vision impairment or not may also have a bearing on the level of support.

Other measures of the quality of the placement were suggested by an expert informant, such as

> reflection of philosophy and attitude to the inclusion of learners with special needs in the school policy;
>
> parental satisfaction with placement;
>
> number of learners with special needs who attend a school; (or the demand for such a placement)
>
> staffing specifically designated to the support of learners with special needs;
>
> level of qualifications and expertise of staff in special education. (Expert)

This suggested that the quantitative study would need to include a measure of the support from the school and/or the teacher. The schools were therefore asked various questions about the numbers of students with special needs at the school.

The skill of a classroom teacher may effect the level of support required. Where the classroom teacher is skilled and willing and able to make necessary adaptations then the level of service needed from the

resource teacher is decreased. The quantitative data collection included measures of the training and experience of the mainstream teacher.

Current support: Education Support Staff

Children with higher needs have support from a teacher aide, education support worker or kaiawhina (support worker in a Maori setting). The quantity and quality of the teacher aide time is important in determining the level of other service required, and to the learning taking place. It may be relevant to know how long the support worker or teacher aide has been working with the individual learner. Some of the teacher aides have braille proficiency, which is helpful for the braille students. Sometimes teacher aides are expected to replace the mainstream teacher or the RTV as the key teacher for that student. However, the teacher aides are employed by the school, with little or no input into the choice of person from either the parents or the RTVs, and vary from extremely competent to less than competent. A description of each is given below.

> …had a teacher aide 1) who did not know braille, and 2) was not terribly literate. So that child required a lot of input from me. (RTV)

> I am…relying on the teacher and the teacher aide who fortunately is very interested and is learning braille and doing all sorts of stuff. She is the key worker for that child. (RTV)

This was not the only case where the teacher aide was perceived as the key worker

> I have been very lucky to have had tremendous teacher aide support. Due to high roll numbers, I rely on the expertise and commitment of the support staff to provide the best support to the student, that they can. (RTV)

The role of the teacher aide differs between primary and secondary school. For an academic blind learner at secondary school, what is often required is more input from a specialist teacher, rather than teacher aide-time, as the person reading for them needs to be able to interpret correctly what is written on the board. This is especially apparent in subjects like chemistry and mathematics. Some learners are fortunate to have experienced subject teachers acting as teacher aides, but the rate of pay is not usually sufficient to attract such people.

The use of teacher aides or other untrained staff is problematic in the area of special education. The implementation of the SE2000 policy in New Zealand led to a large increase in expenditure by the Ministry of Education on teacher aide wages.

An RTV with many years of experience was asked whether she thought that sometimes children were allocated too many teacher aide hours. She responded:

> Yes I do. Yes. And sometimes far too few. But what's tended to happen is that the children have, over the last ten years say, moved from teacher support to teacher aide support. Which is not always the best thing. (RTV)

The same RTV had earlier explained that prior to about 1989 teacher aides for individual children in the class was unheard of. The implications of this are explained well in the following quote:

> And I think it has positive and negative effects. Prior to that time the itinerant resource teacher was the child's only support in the classroom. So that had a big influence of course on how you divvied up your time, bigger than it does now. Teacher aide allocations have muddied the waters to some effect because some teacher aides are better than others and it takes a while to learn which are which. There's a tendency – an unwarranted tendency to treat the teacher aide like another teacher. And to have expectations of that person which are way beyond sometimes their capabilities …and their training. Also because this child now has its own personal adult we are in effect in a lot of cases actually teaching children to be dependent on that person and then later on we have to turn around and teach the child to be independent of that person. We also have to teach the teacher aide to keep out of the way, which is probably the most difficult thing of all. And so it's complicated things to some extent.

This phenomenon is by no means unique to New Zealand. Russotti & Shaw (2002) outlined in-service training for teaching assistants in New York state (equivalent to teacher aides in New Zealand). They summarised various reports and stated that "despite their varied roles, these teaching assistants receive little or no formal training. They do not understand their roles and responsibilities and are often unaware of effective teaching strategies." (p. 483)

Spungin (2003) provided a different perspective in her commentary, "Cannibalism is alive and well in the blindness field." She criticises some of the attitudes among the blindness field, including the negative attitudes towards paraprofessionals (teacher aides) who are considered untrainable or misguided, and asks "Why not treat paraprofessionals as a valuable resource and train them? Why are we so quick to believe this potentially rich resource of personnel can't work with us – or worse yet – may undermine or inappropriately replace us as teachers?" (p. 70) Note that within the United States there is severe shortage of trained teachers of visually impaired students, which may influence this position.

A study of inclusion in an Auckland secondary school indicated that the main teaching role for students with disabilities who have been included in the mainstream was often taken by the teacher aides (Lai et al., 2003). The role of teacher aides and other paraprofessionals is clearly a serious issue. In some regions of New Zealand qualified support teachers are used in addition to RTVs and teacher aides. This provision is funded by the ORRS teacher entitlements of 0.1 and 0.2 teacher time and is some places it is provided in addition to the service provided by the RTVs. In other areas the ORRS teacher entitilements are transferred to resource centres to fund the service provided by the RTVs.

These results indicated a need for care in collecting data on current service provision. The level of competence of the teacher aide is important, along with a clear picture of how help is given, with the combination of RTV service, teacher aide time and support teacher time. In particular it was desirable to find out how the teacher entitlements were being used in each case.

Determinants of need: Factors that change over time

Many characteristics of the school and family environment are relatively stable. So too are the characteristics of the child. There are also factors that affect the level of need that change from time to time. The need for extra service at times of transition was a recurring theme. There was less agreement on whether the need for service decreased as the learner progressed through to high school. Other variable aspects included

- the level of vision (which may be improving, deteriorating or just unstable)
- the health of the child
- family environment and trauma.

It was also suggested that sometimes there was a need for short bursts of more intensive service.

Aspects that might affect the level of service needed also included

- the age of onset of the vision impairment,
- the level of service the learner had received to date,
- how well they are coping in the present setting.

Factors that change: Transition times

Transition times were identified as times when the learner would need more service. These transition times include starting school or a pre-school, moving between schools and into tertiary education or the workforce. These are natural transitions, and there are also children who have additional transitions, due to changing location frequently. This is known to affect learning for children in the fully sighted population, but the effect may be exacerbated for a learner with vision impairment, due to the need to set up support systems each time. This was indicated by the RTV who commented, when talking about a student, that

> Unfortunately he was a transitory student, …whenever he shifted it required a high input once again. (RTV)

This need for extra service is explained here:

> Well you're actually dealing with a whole new setting. You're dealing with their new educators, their new principal, their new class teacher, the new children at the school, Orientation and Mobility, a whole new learning curve.(RTV)

It was also suggested that the need for help would be affected by the nature of the school to which the learner was making the transition.

> There are still some schools which have never had experience of ORRS funded students, and take ages to get into gear re teacher aide, specialist tutor etc. This happens more if the student has shifted from another school or area. (RTV)

Stage at school: Primary/Secondary

The view was expressed that the level of need for learners with vision impairment at secondary school was at least as great as for those in primary school. The needs were different, in that at primary level the emphasis was on achieving literacy and numeracy, whereas there were other issues with respect to access to the curriculum at high school level. This was thought to be important for learners with low vision, as well as for those who were blind.

> I think there is a huge commitment for braille students at high school level and a lot of it I think has to be provided on site and at hand, and cannot be done from a distance. Very low vision students at high school in some ways have a harder time than braille students, because a braille student has got the hard copy given to them often, but a very low vision student who

> cannot access printed text from a whiteboard or OHP or whatever, then has great difficulty, I think more difficulty and perhaps needing as much support but in a different way, and being presented with the notes and in a form that they can visually read. (RTV)

This corresponds to the assertion by Curry & Hatlen (1988) that “for many, if not most visually impaired youngsters, the specialist services required to meet a pupil’s unique needs remain somewhat constant throughout the educational program.” (p. 419)

Other issues at high school included identifying who took responsibility for the learner, and the number of teachers involved with a particular learner.

> Yes, I have got to say I find high schools very difficult to work in, because on the whole even with low vision kids you find that no one really quite takes responsibility. Some schools do it very well, other schools do it extremely poorly. (RTV)

> High schools are quite difficult especially when a child’s starting high school because suddenly instead of dealing with one teacher they’re dealing with eight or nine, who may have quite different attitudes one from the other of what they're going to do with this child from “Gosh this child’s a nuisance” to “Hello, How are you? [very friendly] What can I do for you?” (RTV)

These comments regarding the level of need at secondary school contributed to the decision to focus the research on secondary school students.

The implication for the study was to collect data on the child’s level at school, accepted transition times, and some measure of how they are coping at present, as possible determinants of needs. It would be desirable, if possible, to identify children who had had more than the usual number of transitions.

2.3.4 Other results

Geographical dispersion

The location of the learner, and specifically the distance from the visual resource centre, was suggested as possibly affecting the level of service provided. This has implications with regard to the allocation of funding, but not the determination of resource need. Two identical learners in different geographic locations would have the same level of resource need, though in what manner and to what extent those needs are met may and do differ.

> You have got places where there are a whole lot of students of the same age and need and so you can provide a different type of service for them than you can for one braille student out on their own in (distant location). And yet they should all have the same opportunities.

Attitudes towards categorisation

Labelling students has been politically unpopular. However, the use of labels can be helpful if it is the means to finding solutions. The RTVs were generally pragmatic and most (probably all) of the Resource Centres used some form of categorisation in order to help establish case-load allocations. The systems they used generally involved three or four categories, and either related to the level of vision and other impairment or to the frequency of visit that was recommended.

In addition, the inception of SE2000 had recently introduced a three category system of Very High Needs(III), High Needs(II) and Moderate(I) special needs. There was concern that the verification process used to assign categories did not accurately capture the needs of learners with vision impairment. Much of this has been rectified since. There was also a feeling that the Very High Needs category did not have enough money attached to it, in particular for the braille students, for whom there was a big demand in terms of transcription of materials. In some areas the SE2000 scheme resulted in improved resourcing. Despite concerns with the details of the system, there did not seem to be any problem with the idea of categorisation.

Variation in service levels

In order to establish whether there was sufficient variation in the population to assist in developing a quantitative model, the RTVs were also asked to think about the level of resource provision for the children on their caseload, including RTV, teacher aide, and materials production, but not including Orientation and Mobility. They were asked how many of the children would be getting most of the resources they need and whether there were any getting no extra input at all. Orientation and Mobility was covered separately. Generally the RTVs felt that some of the students were getting the level of service that they should, but between half and a third of their caseloads were not getting sufficient for their needs. As one RTV pointed out, it may be that their expectations for how much service a child should receive change in response to their circumstances. The RTV working in a resource room felt that the students there were getting close to an ideal service. There was a feeling generally that levels or types of service were different between centres.

2.4 Contributions of the preliminary study

The purpose of the initial study was to gain a clear picture of the problem situation from the viewpoint of stakeholders, and to inform later data collection. Through the interviews and analysis, followed by reporting, further feedback and analysis, and triangulation with the literature, many important factors were uncovered. In particular the initial study

- Articulated and clarified the purpose of the service provided by the RTVs.
- Introduced and explored the idea of measuring access to the curriculum.
- Provided a comprehensive list of potential determinants of need.
- Indicated the need for research particularly among students at secondary school.
- Gave an indication of the complexity of the problem with regard to the individual nature of need and variation in practice throughout New Zealand.

This provided a good foundation on which to build the later research.

2.5 Personal standpoint

> As researchers we must make it clear to ourselves, and to all those concerned what values our research is to promote and *whose values* they are: for whether we want it or not, we will hardly ever be able to claim that our research serves all interests equally. (Ulrich, 2001, p. 9)

An important difference between most qualitative and quantitative research is the epistemological assumption about the relationship of the researcher to the researched. (Creswell, 1994; Kvale, 1996; Merriam, 1998) The positivistic view associated with quantitative research asserts that the researcher is independent from what is being researched, and is able to be objective. In contrast, “The qualitative investigator admits the value-laden nature of the study and actively reports his or her biases.” “The researcher interacts with that being researched.”(Creswell, 1994, p. 5) This section is included so that my personal biases may be more explicit. In addition it outlines how my personal situation has informed the inquiry, so that in some respects it comes from an insider viewpoint.

Though the underlying positivist image of a quantitative researcher is of the impartial scientist objectively reporting results, post-postivist thought would contest this. There is opportunity for bias in the performance and reporting of quantitative research, both in what is reported and what is left unsaid. To ignore this is to disregard a potentially important influence on the analysis and the reporting of a quantitative study. For this reason also, it is necessary to state my potential biases, so that readers may draw their own conclusions as to how my biases have affected the research, both qualitative and quantitative.

Because this section deals with personal background and bias it is written in the first person. It contains an explanation of my background in the area and my potential biases, including how they may have changed over the duration of the research, the benefits for the research of my “inside knowledge”, and the benefits I have gained from the research.

Background

My awareness of the allocation problem arose because one of my sons is totally blind. Jonathan was nine years old when I began the research. In general he has had a good level of education, but he has suffered throughout his schooling from a lack of Orientation and Mobility instruction and the effects of overworked RTVs. As I complete the research Jonathan is completing his second year at high school.

Over Jonathan's lifetime I have been active in the support and lobbying organisation, Parents of Vision Impaired, through which I have gained further insights into life for children with vision impairment and their families. My attitudes towards the rights of people with disabilities have definitely altered as a result of the association.

I have also trained and worked as a secondary school mathematics and computing teacher. From this viewpoint I can understand the reluctance a mainstream teacher might feel about including a child with a severe disability in his or her classroom, especially without sufficient support or training.

Biases

In December 1998, at the commencement of the research I wrote a statement of bias, which is included in its entirety in Appendix 2. The following summarises the beliefs expressed in it:

- Children who have disabilities have a right to the education that will help them function as best they can. Funding should be provided by the government and used effectively. The decision making process concerning resources for learners with vision impairment should be explicit. It is not possible to satisfy all the needs of all the children. Learners with vision impairment have historically been under-funded, especially when compared with their equivalent with a hearing impairment.

- Parents have a right to be involved in the education decisions regarding their child. However the government is not required to fund extreme choices by parents, nor should satisfying the rights of the child with the disability impinge on the rights of other children in a class or school. I do not believe it is realistic to expect to provide the same level of service in all geographic locations (For example, in a large city like Auckland and in a remote country area such as Reefton).

- Services for children with vision impairment are best provided by people who have training in services for children with vision impairment. Teachers of learners with vision impairment need to be rewarded for their expertise.

- My allegiances lay with the Resource teachers and the parents and I did not feel that the Ministry of Education had the same level of commitment to the learners with vision impairment. I was unsure that the Royal New Zealand Foundation of the Blind was making decisions with the best interests of the students in mind. I believed the RTVs could be disinterested, but that the RNZFB suffered from protectionism and a lack of professionalism in some areas.

- Though coming from a quantitative discipline, I felt quantitative methods are often misused.

Most of the first part of the original statement of bias would hold true for me today, seven years later. However my allegiances would be less well delineated. Some might say I have “gone over to the other side”. Contact with the Ministry of Education has increased my confidence in it. The establishment of the Blind and Low Vision Education Network New Zealand (BLENNZ) has demonstrated that change as a result of parent demand is possible. I am less inclined to consider the RTVs as the paragons of virtue I thought them at the start. Many of them are very dedicated and hardworking, but, as is the case in all human endeavours, “some are more equal than others.” The RNZFB has undergone major changes and improved greatly in its services for children over the time span of the project. It also funded much of the travel for data collection in this research. It is a much more professional organisation than it was a decade ago.

In particular I can understand that immersion in a certain sector, in this case education for vision impaired, can lead to an over-emphasis on that sector. There is a tendency for parents and teachers to be satisfied with nothing less than an ideal education for these students. (And maybe this is as it should be - if they are not ambitious for them, no one else will be.) It is reasonable to suggest that the students need every opportunity to learn. However, I can also understand the possible viewpoint of the Ministry of Education. There are many students with no identified special needs who are not getting the educational opportunities that the children with vision impairment are. This gives rise to the question of whether it is reasonable for a few children to have large amounts of money spent on them, when the same amount of money could help many other children to have better access to the curriculum.

Benefits and disadvantages to the research of insider knowledge

My background experience with vision impairment was an advantage as it gave me a solid understanding of many of the issues before even beginning the research, and gave me credibility with the parents, teachers and the students I interviewed. It also made it easier for me to work in schools when I was collecting data, as teachers were happier to have “another teacher” in their classroom. My background in vision impairment was also potentially a disadvantage as it was clear that there may be conflicts of interest.

As my son was starting secondary school as I was completing this research, I was able to draw on my experience with him to test out ideas that have come through from the interviewed students. Jonathan was not in the target group at the time of the data collection so was neither included nor excluded from

the data. Like the students in the target group, Jonathan really likes school, is motivated and enjoys the more structured setting of secondary school better than primary school.

The value of being the parent of a blind child, in the completion of this thesis can not be over-estimated. Time and again throughout Jonathan's schooling I have been challenged to examine what is and is not possible and relevant in the education of a learner with vision impairment. I have had insights into the funding mechanisms and their implications, including the choice of fund-holder.

Benefits I have gained

The synergies have not all occurred in favour of the research. I benefited from suggestions from parents and gained motivation to help Jonathan achieve his potential. I have also increased in understanding of the unique needs of blind students, and have been able to use this to help his teachers overcome barriers to learning.

A comment from a parent described putting together "a couple of pages ("CV") showing our son's photo, interests, achievements, information on his condition etc. This was so the teachers knew of/about our son before he set foot in the school." As Jonathan was about to enter high school, I took notice of this advice and did similarly, with very positive feedback from the teachers.

A further positive effect has been my appreciation of the level and quality of support Jonathan has received throughout his schooling, and particularly at secondary school. His level of support is as good as for any other child like him in New Zealand.

Part B

Developing a Measure of Effectiveness

Chapter 3: Introduction and Literature Review

3.1 Introduction

The research reported in the previous chapter provided a background to the issues involved in determining resource need among learners with vision impairment and identified potential outcome measures. The potential outcome measures included

- a measure of satisfaction by the child, parent and/or mainstream teacher,
- a measure of achievement of IEP goals,
- measures of access to each part of the New Zealand curriculum,
- a measure of happiness or self esteem,
- academic achievement, and
- achievement in the expanded core curriculum.
- other suggestions including choice of curriculum areas, access to recreation and daily living skills.

These suggestions led to the decision to create an instrument to measure opportunity-to-learn the New Zealand (or intended) curriculum. This instrument was able to incorporate several of the ideas listed.

There was no satisfactory outcome measure available to evaluate how well the service was accomplishing its purposes in general, or to compare service provision between individuals. Examination results are often used in educational research as they are reasonably easily collected, and are generally accepted as reflecting a key purpose of schooling, namely to increase students' knowledge, understanding and skills. Examination results were not suitable outcome measures for this study, and another measure was needed. A key finding from the preliminary study was that a purpose of the extra provision was to provide learners with vision impairment with equal opportunity to learn as their peers, to somehow compensate for the disadvantage due to their disability. Consequently the next phase of the research involved developing an instrument to measure opportunity-to-learn, that could be used to assess educational effectiveness for learners with vision impairment. This chapter describes the rationale behind the development of an instrument to measure opportunity-to-learn, chapter 4 relates the process by which it was developed and chapter 5 gives evidence of the validity of the approach and some results from the baseline study of 1300 pupils in regular schooling.

In New Zealand at the time of the study there were two levels of national examination – at the end of year 11 and year 13. These results would be available for only a small sector of the target population, namely those in year 12 and those who were leaving school at the end of Year 13 having completed bursary examinations. Progressive Achievement Test (PAT) results may also have been available, but these are not always administered to learners with vision impairment, particularly those who are totally blind. There was no suitable measure of academic achievement that would apply over more than a small subgroup of the population (which was also small). As is shown in the literature, even if a measurement of academic achievement were available, it is not clear that academic results encapsulate enough of what school is all about, particularly for learners with vision impairment, nor that it will necessarily reflect the effectiveness of the service provision. The concept of measuring opportunity-to-learn skills, as developed in this research, encompasses a wider role of education and provides indicators of the process of education.

As the population of learners with vision impairment is a very small one, it was decided to develop the instrument using a sample of the regular school population. This would also provide baseline scores with which the results for the learners with vision impairment could be compared. The baseline sample was used to evaluate the validity and usefulness of the instrument, The findings from this analysis, and the development of the instrument are an important contribution of this research. The choice to focus on students in the first three years of high school has been explained previously (page 5).

3.2 Measures of educational outcomes

Research into school effectiveness aims to obtain knowledge about the process of education and identify relationships between what a school does and the long-term outcomes for individual students. A long-standing problem has been to find ways to measure student progress or achievement that somehow reflect the contribution of the school or programme while controlling for other factors including the student's ability, prior schooling and background, and the school's socio-economic environment. In parallel with this has been a call in society for schools to be more accountable, which in many cases has led to school effectiveness, particularly at secondary school level, being judged on the academic results of pupils, ignoring all other factors.

The most commonly used output measures reflect academic performance by groups of students (schools), usually measured through examination results. Academic results are relatively easily collected and aggregated and frequently used as indicators of student learning and future prospects. League tables of examination results in New Zealand, the UK and other countries are popularly used as indicators of school contribution or quality. Decades of school effectiveness research, particularly research using value-added have shown that examination results are affected more by the innate ability of the students and the socio-economic area from which the school draws its pupils, than by attributes of individual schools. Harker & Nash (1996) evaluated the effects of school composition and school contribution on examination results, using multi-level modelling, and concluded that "raw examination scores…are a quite inadequate basis for evaluating school effectiveness." (p. 167) Examination results are a measure of individual academic learning but do not give the whole picture with regard to the effectiveness of a school academically, and give little information about other outcomes (Gray, 2004; Griffith, 2002).

Schools also contribute to other learning, preparing young people to participate fully in society. Academic results may not reflect this learning, for example in leadership, integrity, empathy, goal setting, self-esteem and parenting skills. It is possible that this learning-for-life has a stronger effect on the future life of a pupil than the academic learning measured by examinations. The New Zealand curriculum framework (Ministry of Education, 1993) states that "All young people in New Zealand have the right to gain, through the state schooling system, a broad, balanced, education that prepares them for effective participation in society" (p. 5) and includes in its principles that the New Zealand curriculum will "provide coherent goals and learning experiences which will enable students to achieve their potential, to continue learning throughout life, and to play their full part in our democratic society and in a competitive world economy." (p. 6) Griffith (2002) discussed the call by

the American public for learning environments that develop "effective and active citizens", and chose to measure students perceptions of quality of instruction and school respect of students.

This learning-for-life, though important, is difficult to quantify and measure, and even more problematic is identifying the contribution of a school to this learning, as opposed to that of the family, other agencies and social structures such as churches and sports-clubs, and part-time employment or other life experiences. Gray (2004) in a review of three decades of British research into school effectiveness asks "What do we know about the differences between schools in terms of other pupil-related outcomes of schooling beyond academic results?" (p. 186)

In addition to academic and other outcomes, there is value in the total experience the student has of school which in itself may influence later decisions and attitudes. Samdal (1999) likened school to a work-place and proposed that satisfaction with school is an important outcome in itself, as well as being related to success in school. Satisfaction with the school experience may well lead to better attitudes to learning after the formal schooling process is over. There is a need for students to become "life-long learners" in this world of increasing knowledge and advancing technology, and this attitude needs to be nurtured in the schooling process. School can be a very big part of a student's life, and if it is a happy, successful experience, this will increase their quality of life during and after their school years, surely an important consideration. In relation to the learners with vision impairment, important aims were identified to be that the learners are happy in their current school experience, and that they are prepared for future life.

The absence of recognised output measures other than academic was apparent in the survey by Worthington (2001) of the application of frontier efficiency measurement techniques (DEA) in education. Of the twenty-eight analyses surveyed, one study used a measure of self-esteem in addition to reading and mathematics test scores; and a few studies used drop-out and employment rates. All other output measures for the education production function in the analysis were either academic grades or based on them.

Saunders (1999), in her history of the concept of "value-added" in education, suggests that by the late 1990's the term "value-added" "was used to mean something like 'a fairer or more accurate measurement of students' performance and therefore of the quality of their education.'" (p. 233) The concept of value-added had been developed in response to centrally imposed funding and accountability mechanisms introduced into the education system in the late 1980s. Its aim was to answer the question of how student progress can be measured in such a way as to provide information on the performance of the school or other institution. While outlining the background of the idea of value-added, Saunders also discusses some issues that occur in trying to fit an economic input-output

model to the education or schooling process. In particular it is not entirely satisfactory to define the outputs as "educated students", when they themselves can also be viewed as both inputs and part of the process. This also begs the question of who is adding the value in the case of individual students, the school, the student or the community.

There are examples in the research literature of where measures of non-academic outcomes have been implemented. Both academic and non-academic output measures were used by Schagen, Kendall, & Sharp (2002), who evaluated the success of a sport–linked educational initiative. The measures included outputs such as "maths enjoyment", self-esteem and study skills, using a self report questionnaire with students in years 6 to 9. In a state-of-the-art longitudinal study of secondary schools in Flanders (known as LOSO) non-cognitive outcomes comprising attitudes, motivation, social integration and academic self-concept were measured through a questionnaire to pupils. (Van Damme, De Fraine, Van Landeghem, Opdenakker, & Onghena, 2002; Van Landeghem, Van Damme, Opdenakker, De Fraine, & Onghena, 2002)

Closer to home, Nash & Harker (1998), in the five year *Progress at School* project, used an Intake Ability Score (year 9), progress results in English, Mathematics and Science at Year 10 and examination results from Years 11, 12 and 13 to evaluate the progress of over 5000 students at thirty-seven New Zealand secondary schools. A "Quality of School Life" (QSL) instrument was administered at the end of Year 10. The responses from the QSL were analysed using factor analysis to identify the key constructs of students' perceptions of school life, in order to explore the relationships between attitudes and their academic progress. Other surveys were made of the students, including of cultural activities with parents, involvement and interest in reading and fourth form (Year 10) aspiration. Interviews and classroom observation were also used to inform the quantitative results. This combination of academic and other methods provided a wider range of explanatory data, while academic results provided the outcome measure.

Most educational effectiveness studies use academic output measures, sometimes alongside other measures but these were not appropriate for the current study. It was necessary to explore other possibilities.

3.3 Opportunity-to-learn

The preliminary study identified that the aim of extra educational provision for learners with vision impairment was to provide opportunity to learn, or access to the curriculum equivalent to that of their fully-sighted peers. As Porter (1991) states, "Schools provide educational opportunity; they do not directly produce student learning," (p. 13) and "commitment to equality of educational opportunity requires monitoring student opportunity to learn." (p. 26) McDonnell (1995) discusses the development of Opportunity-to-learn (OTL) as a research concept and a policy instrument. The idea of measuring "opportunity to learn" and the term itself originated in the First International Mathematics Survey, conducted by the International Association for the Evaluation of Educational Achievement (IEA) in the early 1960s. There, OTL was a technical concept used to compensate for differing curricula between countries, and curricular coverage by teachers. OTL at this stage was measured by asking the teachers whether specific content had been taught, and to what level.

According to McDonnell (1995), by the mid-1980s the concept of OTL had developed into a set of process indicators comprising measures of teacher background, materials, and strategies, again mostly from a teacher perspective. Its application was confined mainly to mathematics and science, and emphasised topic coverage more than teaching methods. The results were used to compare OTL for different subgroups of the population, including comparing boys with girls and different ethnic groups. OTL then evolved into a policy instrument, as part of the Goals 2000 agenda (Goals 2000 Educate America Act, 1994). Among McDonnell's conclusions are that OTL has influence as a generative concept or "tool that not only captures the normative assumptions embodied in a particular policy goal, but also synthesizes empirical data so as to identify a particular strategy for achieving the goal, and perhaps even provide a guide for how to measure progress in moving toward the goal," (p. 305) and that "OTL standards, combined with a good indicator system, can play a meaningful role in those individual schools and districts willing and able to take advantage of the framework provided." (McDonnell, 1995, p. 318)

Ysseldyke, Thurlow, & Shin (1994), in their article on opportunity-to-learn standards, identify different views of OTL and major issues regarding OTL, and draw attention to the implications for students with disabilities. They conclude that "viewing opportunity to learn as something more than just the financial resources in a school is noteworthy."(p. 76)

The term "opportunity-to-learn" has also been used by Marzano (2000) in his review of school effectiveness research and subsequent book for practitioners (Marzano, 2003). He uses the term to encompass variables such as content coverage, focus on skills and concentration on teaching, which

are drawn from earlier school effectiveness studies. He defines his variable, OTL as "the extent to which a school (1) has a well-articulated curriculum, (2) addresses the content in those assessments used to make judgments about student achievement, and (3) monitors the extent to which teachers actually cover the articulated curriculum." (Marzano, 2000, p. 53). Based on his review of studies of school effect he proposes that "the strength of the OTL relationship with student achievement and its logical appeal make it a more useful school-level variable in terms of explaining the effects of schooling on student achievement than content coverage."(p. 53) He presents OTL as the top ranking school-level factor in its effect on student achievement.

3.4 The Attrition of the Intended Curriculum

The International Association for the Evaluation of Educational Achievement (IEA) studies of mathematical and science education introduced the concept of opportunity-to-learn and also a way of classifying the manifestations of curriculum (Martin & Kelly, 1997). The aspects of the curriculum defined for the Second International Mathematics Study (SIMS) and the Third International Mathematics and Science Study (TIMSS) were the "intended curriculum", the "implemented curriculum", and the "attained curriculum" (Martin & Kelly, 1997; Travers & Westbury, 1989).

Porter & Smithson (2001) build on this framework, using the terms intended, "enacted" (corresponds to implemented), "learned" (corresponds to attained) and "assessed" (possibly a component of the intended curriculum). I suggest that between implemented curriculum and attained curriculum lies a further distinction, "received curriculum", which is the content as experienced by each individual student. This is a function of the content delivered by the teacher (the implemented curriculum) and is necessary but not sufficient for the content to be learned by the student. It also reflects the individual nature of the learning experience, and that different students in the same class will have different perceptions of the same implemented curriculum.

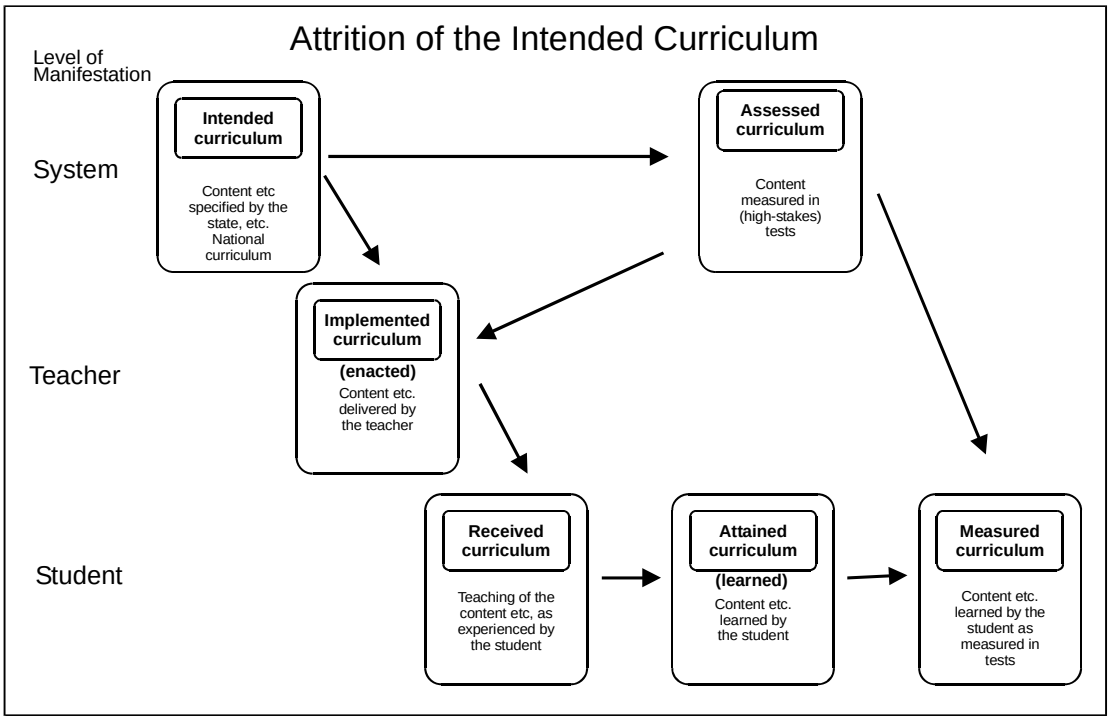


Figure 2. Attrition of the Curriculum

Figure 2 shows the relationships between these different aspects of curriculum. The process shown can be described as "attrition of the intended curriculum" or perhaps mutation, as each stage in the process represents a change, usually a reduction, in the quantity or quality of the content etc. within the curriculum. The process originates with the ideal as described in the intended curriculum, and culminates in the attained curriculum as learned by the individual students, a subset of which can be displayed in the measured curriculum. The term "content etc.", used in the definitions, comprises the content or material, skills, attitudes and values that are contained within curricula. The arrows indicate an influence relationship, involving some amount of loss. The arrows usually point from a superset to a subset.

The intended curriculum influences both the assessed curriculum (material chosen to be measured in tests) and the implemented curriculum (teacher behaviours and decisions). The implemented curriculum is also influenced by (though not necessarily a subset of) the assessed curriculum, especially when high stakes tests are involved. The intended curriculum may include a much wider range of material and skills than the assessed curriculum, but the pressure for students to pass a certain test may preclude the teaching of material not directly included in the assessed curriculum. Received curriculum (similar to opportunity-to-learn) is related to the implemented curriculum provided by the teacher, and is the precursor to the students' learning (the attained curriculum). "Measured curriculum" is additional to those discussed already, and is a function of the material selected from the intended curriculum to make up the assessed curriculum, and the individual student's learned curriculum. It is only an approximate measure of what, from the intended curriculum, the student has learned. Measured curriculum is the basis of much reporting on the efficacy of schools as it is summarised in "league tables" of examination results.

Students also learn many things at school which are not part of the intended or official curriculum. This is sometimes known as the hidden, covert or implicit curriculum (McGee, 1995). This unintended curriculum is outside the scope of this present study.

The vertical dimension in Figure 2, labelled "level of manifestation", and containing the words "system", "teacher" and "student", has been used to show the level at which each manifestation of the curriculum occurs, as indicated by Travers & Westbury (1989).

This framework is useful in identifying which aspects of the curriculum are being tested by an instrument. The level tested by an instrument is a function of whose opinion is sought. Teachers report on the implemented curriculum, while students report on the received curriculum. Examination results correspond to the measured curriculum. This framework is also useful for teachers in contemplating

the effects of their choices and methods on their students' learning, and conceptualising the effects of policies and impairments.

In view of the current area of focus, learners with vision impairment, it is instructive to use this framework to examine where the vision-impairment may be causing greater attrition, and the role of the extra service provision and the expanded core curriculum.

This discussion relates to students with vision impairment who are receiving their education in a regular school setting among sighted students, as is generally the case in New Zealand. Vision impairment can hinder the pathway between the implemented curriculum and the received curriculum. If the classroom teacher is unaware of the student's inability to see what is on the board, or as is more likely, is unaware of the educational implications of the vision impairment, then the content received by the student will be less than that received by their sighted classmates. Taken to an extreme case, in the absence of any extra resourcing, the amount of curriculum received by a totally blind child in a regular classroom would be only a fraction of what the others are receiving. Similarly, if the student does not get help developing the specific study skills needed by students with vision impairment, the pathway between the received and the attained curriculum will also be affected. The loci of potential loss are indicated in red in Figure 3.

The Expanded Core Curriculum includes elements which aim to reduce this attrition. Compensatory academic skills include study skills and braille instruction, which better enable the blind child to have access to the curriculum; visual efficiency skills enable a student with low vision to gain better access to the curriculum by increasing the quantity and quality of what they can see. Further, the intended curriculum is the New Zealand Curriculum, which includes in its ambit self-management, social, physical, and work and study skills alongside the more conventional literacy and mathematical skills. (This will be elaborated on later in the thesis.) The Expanded Core Curriculum specifies some of these essential skills in terms specific to vision impairment. It could be regarded as part of the intended curriculum for students who are blind and vision impaired. These relationships are summarised in green in Figure 3.

Another area where the attrition can be greater for learners with vision impairment than for the regular population is the pathway between the intended curriculum and the implemented curriculum. A teacher can make assumptions about what topics and areas of the curriculum are suitable or necessary for a learner with vision impairment. In some cases they may judge correctly that the material as it is presented to sighted students is incomprehensible or irrelevant to a student with vision impairment. For example the use of different fonts and colours in visual language topics may have little relevance to a totally blind student. They may need to know of their existence, but may not be able to apply the

principles. This is discussed by Cooke (2000) in his thesis on Blind Students and Visual Language in New Zealand Schools. However it is possible that other parts of the curriculum, which could be made available to the student with vision impairment, are avoided as they are perceived to be too difficult or inconvenient, or the teacher lacks the skills, training, time or inclination to adapt them.

Formal examinations are also a problem area for students with vision impairment. In order for the measured curriculum to reflect the attained curriculum in a way that does not provide extra disadvantage to a student with vision impairment, the examination must be adapted to the most appropriate medium for the student. This can mean transcription into braille, expansion into large print, and providing a trained emanuensis to provide visual information during the examination. These tasks must also be performed by specialists.

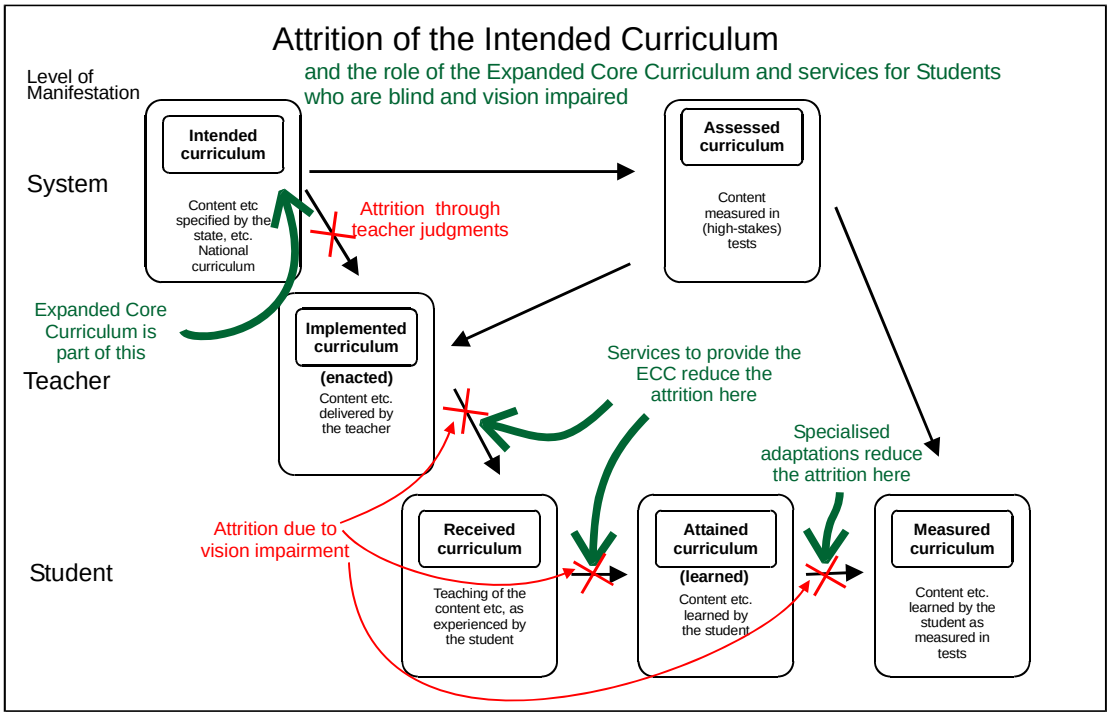


Figure 3. The Expanded Core Curriculum and the Attrition of the Curriculum

Measuring Students' perceptions

Measurement of opportunity-to-learn began with the IEA studies and was based on the intended curricula of different countries and the implemented curricula of teachers, as reported by the teachers. Later efforts within the School Effectiveness literature to measure opportunity-to-learn have generally been based on teacher reporting. The definition of OTL used by Marzano (2003) reflects provision of teaching or the implemented curriculum. Porter & Smithson (2001) and later Chavez-Lopez (2003)

used teacher questionnaires to identify opportunity-to-learn with respect to the implemented curriculum.

The approach taken in this research is to focus on the received curriculum and to ask the students themselves. Porter (1991) states that "The most important school process indicators are ones that describe the enacted curriculum, what is actually taught in the classrooms across the nation."(p. 25) Porter also comments that, "If primary interest in describing the content of instruction is to obtain a good predictor of student achievement, then perhaps content defined from the student's perspective would be most valid."(p.18) However he expresses concern that the student's level of understanding of the content would affect their perception of what had been taught. Another concern he expresses is the level of specificity required. He addresses this with regard to mathematics in a later paper, (Porter, 2002), by developing specific language and criteria for measuring content coverage. I further explore the idea that opportunity defined from a student's perspective is a valid descriptor and suggest that perception of opportunity-to-learn *skills*, rather than content, may be less affected by the students' understanding of content, and may be more easily generalised. This idea is explained further later in this thesis.

Herman & Klein (1997) and Herman, Klein, & Abedi (2000) explored ways of assessing OTL, including surveys of teachers and students. Their purposes for assessing OTL included ensuring equitable opportunity for population subgroups and providing important feedback to school and policy makers. They found that "patterns of relationships among and between teacher and student responses showed areas of promise and challenge in using surveys to measure students' OTL." ((Herman & Klein, 1997, p.15)

Other recent studies have analysed the views of students of various age levels regarding learning and school experience. Gentilucci (2004) is convinced that "as long as research continues to ignore and marginalize the student perspective…the prospects for developing truly effective learning interventions and reforms may remain dim indeed."(p.7) SooHoo (1993) included middle school students as "co-researchers" who progressed to become "change agents" in the school. She commented that "traditionally, students have been overlooked as valuable resources in the restructuring of schools." (p. 392)

Fitz-Gibbon & Kochan (2000) explore the idea of using indicator systems relying on questionnaires to students. They cite the successful A-Level Information System (Edwards, Fitz-Gibbon, Hardman, Haywood, & Meagher, 1997), in which Year 13 students were asked to report on the frequency of various learning activities. The student responses revealed a difference between styles of teaching for

different subjects. Fitz-Gibbon & Kochan (2000) further suggest that the reliability of using younger students to assess classroom processes deserves investigation.

McCall et al. (2001) report on the attitudinal measures taken as part of the major research involving 56 schools, ISEP (Improving School Effectiveness Project), which was undertaken in Scotland from 1995 to 1997, studying school effectiveness from many viewpoints. The written questionnaires for primary and secondary school pupils contained up to 44 items relating to the school work, the teachers and school community and the wider value of school education. Factor analysis identified the key themes, "engagement with school", "pupil culture", "self-efficacy", "behaviour", and "teacher support". These themes were consistent with those identified in later qualitative interviews. The researchers commented that "the inconsistency among pupil views sheds important light on the subjective nature of school experience and the differential impact which schools have on their pupils and on their teachers over time…" (p. 80) This provides weight to the need for the distinction between the implemented and the received curriculum. Some conclusions were that pupils are capable of mature discussion about a range of issues affecting them and their schools, that pupils enjoy the opportunity to express their views, and they do not get many such opportunities McCall et al. (2001). They conclude that younger, and even primary school students are able to contribute useful information with regard to their schooling.

Flutter & Rudduck (2004), in their book, "Consulting Pupils, what's in it for schools?", give evidence for the efficacy of asking students on a wide range of topics related to school and learning. They also suggest that the perception is more important than "the facts" – that how the students see reality is at least as important as the reality itself (reality as perceived by whom - the teachers?). This aligns with the discussion previously concerning the relationship between the received or experienced curriculum and the implemented curriculum.

These studies, and the growing body of research based on student perceptions lead us to propose that there is justification for asking the students for their perceptions of the learning process. (See, additionally, Boyd & Lawson (2004); Samdal, Wold, & Bronis, (1999))

Conceptual framework

The instrument is designed to measure Opportunity-to-learn in terms of the perception of the student.

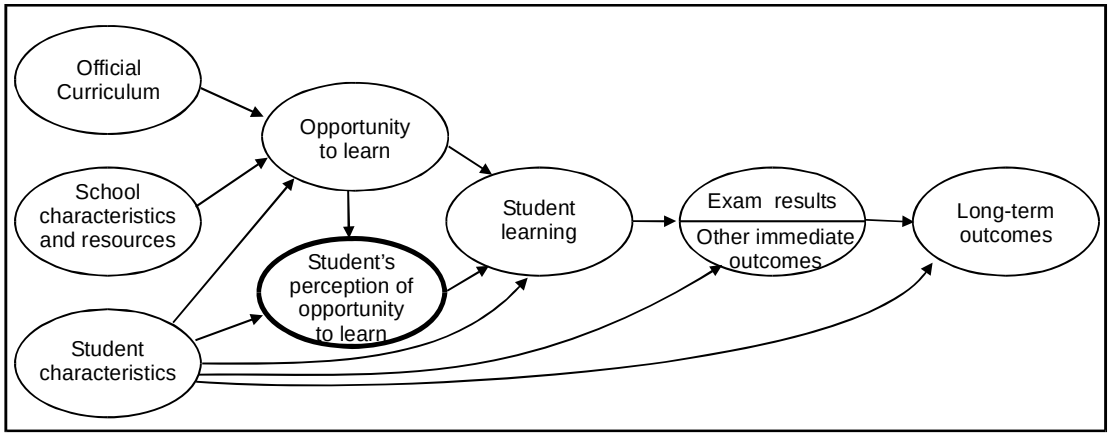


Figure 4. Conceptual Framework regarding Student's perception of opportunity-to-learn

Figure 4 summarises the conceptual framework for the instrument and shows where the "student's perception of Opportunity-to-learn" fits in the relationships between the various aspects of the schooling phenomenon. Each arrow in the diagram indicates a possible influence or cause-and-effect relationship. The element, "School characteristics and resources" encompasses all aspects of a school that create or hinder opportunity-to-learn, including decisions made by school principals, and individual teachers. It also includes the contextual aspects of schools. (See Willms & Raudenbush, (1989).) Opportunity-to-learn is the result of the combination of the school characteristics and resources, the official (intended) curriculum and the student characteristics. Student characteristics include, for example, attitude, aptitude, sex, ethnicity and culture. These influence opportunity to learn and students' perception of opportunity to learn, actual learning, examination results and other immediate outcomes (e.g., leadership skills) and long-term outcomes. Student learning encompasses all aspects of development within schooling, and influences examination results and other immediate outcomes, which in turn affect long-term outcomes.

An instrument was developed to measure students' perception of opportunity-to-learn, which derives from actual opportunity-to-learn and student characteristics, and itself affects actual student learning. It could also be said that measuring opportunity-to-learn is a measure of the "received" curriculum. The development of the instrument is described in Chapter 4.

Chapter 4:

Developing the instrument

4.1 Aims

This instrument was developed for use in further research and evaluation, and to measure the opportunity-to-learn for a specific population, learners with vision impairment. The principal research question for this part of the research is:

"Can an instrument be developed that uses responses from pupils to measure aspects of opportunity-to-learn?"

Further questions relate to what we can learn from using the instrument, such as

"Can the instrument measure differences in opportunity-to-learn between schools and between boys and girls or other subgroups of the population?"

With reference to the original purpose of the research, the question is:

"Can an instrument that measures opportunity-to-learn be used to evaluate services in special education?"

In developing this set of indicators, several positive and negative criteria were identified. The instrument needs to be usable, interpretable and comparable over a wide range of ages, abilities and settings. The original aim was to be applicable for school years 6 to 13 (ages 10 to 18), but within this particular study the target population was eventually limited to years 9 to 11 (the first three years at High School, ages 13 to 16). It was desirable for the indicators to reflect the quality and variety of

individual student experiences or “received” curriculum. Both academic and non-academic aspects of schooling from within the “intended curriculum” were to be given weight.

As much as possible the indicators were not to be related to specific subject content, which can be age, setting or ability specific. It was not desirable for the measures to be made up of resource levels, such as the number of books in the library or average teacher qualifications; nor should the instrument include measures of activity, such as number of classes taken by students or teacher absenteeism, all of which have been used in measuring some aspect of Opportunity-to-learn in other studies. As the focus is on the received curriculum, it was more appropriate to consider the students’ perspective than have classroom-level measures.

At the time of development the main purpose for the instrument was to assess service provision and “received” curriculum for learners with vision impairment, but the potential for use in school effectiveness research and school improvement for the general population has become more apparent throughout the course of the study.

4.2 Focus on Skills

The New Zealand curriculum, and in particular the Essential Skills of the New Zealand curriculum, provided a useful vehicle to research opportunity-to-learn across a country. New Zealand, (population 4 million) has a national curriculum which is designed to provide overall coherence to teaching, but which is not highly prescriptive (Fiske & Ladd, 2000). The national curriculum framework "comprises a set of national curriculum statements which define the learning principles and achievement aims and objectives which all New Zealand schools are required to follow." (Ministry of Education, 1993, p. 4) The New Zealand Curriculum encompasses Principles, Essential Learning Areas, Essential Skills, and Attitudes and Values. The Principles include: "The New Zealand Curriculum provides all students with equal educational opportunities.", and "The New Zealand Curriculum fosters achievement and success for all students." (Ministry of Education, 1993, pp. 6,7) Schools and teachers in all New Zealand schools design their programmes using the Essential Learning Areas and Essential Skills to determine the content and skills to be taught.

There are seven Essential Learning Areas specified: language and languages, mathematics, science, technology, social sciences, the arts, and health and physical well-being. The eight Essential Skills[1] are listed in Table 4 and detailed in full in Appendix 6.

Table 4. The Essential Skills of the New Zealand Curriculum.

Communication Skills
Numeracy Skills
Information Skills
Problem-solving Skills
Self-management and Competitive Skills
Social and Co-operative Skills
Physical Skills
Work and Study Skills

[1] At the time of writing (2005) the Ministry of Education was in the process of replacing the Essential Skills, attitudes and values with five key competencies. It is the subject of a further research to identify the relationship between the questions in the instrument and the new competencies. The Essential Skills remain the focus for the remainder of this thesis.

The Essential Skills are eight groupings of skills to be developed across the curriculum by all students throughout the years of schooling. In some countries these might be known as key skills, key competencies, essential learnings, foundation studies, or core objectives (Le Matais, 2003). They encompass the skills important for students to achieve their potential and to participate fully in society, including the world of work (Ministry of Education, 1993). The list of Essential Skills was introduced as part of the New Zealand curriculum in 1993.

The Essential Skills are reproduced in full in Appendix 6. The following example of the Information Skills group illustrates the scope of the Essential Skills:

Students will

- "identify, locate, gather, store, retrieve, and process information from a range of sources
- organise, analyse, synthesize, evaluate, and use information
- present information clearly, logically, concisely, and accurately
- identify, describe, and interpret different points of view and distinguish fact from opinion
- use a range of information-retrieval and information-processing technologies confidently and competently."

These skills would be demonstrated to different levels at different ages, but would be relevant through most of the schooling process.

The Essential Skills, rather than the Learning Areas, were chosen as the basis on which to develop the instrument to measure opportunity-to-learn. One reason is that the skills are less specific to year levels or age groups than are the Learning Areas. For example in the mathematics Learning Area there are certain topics that are specific to year level, such as calculus and trigonometry. The Essential Numeracy Skills, however, include skills such as the ability to "use measuring instruments", or "estimate proficiently and with confidence", which apply over a wider range of age and ability. The skills can also be regarded as a means of acquiring the content in the Learning Areas. In this way measuring opportunity-to-learn skills also measures opportunity for further learning.

There is no implication that the individual skill sets are independent. For example, there is overlap between the ideas expressed in the Work and Study Skills and the Self-management and Competitive Skills. This shows up later in analysis of the responses. Nor is it suggested that the list of Essential Skills is necessarily comprehensive. There are many dimensions to schooling, and some of them are being measured here.

4.3 Devising the scale

As a starting point, each of the specific skills within the Essential Skills was analysed separately and within its group. This involved careful consideration of the skill itself, what might give a pupil opportunity to develop that skill, and what might prevent or hinder that development. Statements were devised which captured the presence or absence of opportunity to learn the skill. Note that the matter in question is not the extent to which students have acquired these skills, but rather if there is an opportunity in their schooling to learn them. This consideration drew on personal experience as a teacher to produce the original set of statements. Because of the focus of the study as a whole, particular attention was paid to areas in which a learner with vision impairment might be hindered in having opportunity to learn that skill, while still ensuring that it did not limit the applicability of the instrument to the general population.

Table 5. Examples of the Essential Skills and associated items and responses

Essential Skill group	Specific skill Students should be able to:	Items for the questionnaire	Response sets
Work and Study Skills	work effectively, both independently and in groups	I work on my own, without help from others. I work as part of a group. At school I learn ways to work better in a group.	Every day, Most days, Sometimes, Almost never, Never. Often, Sometimes, Almost never, Never. Very True, Somewhat True, Not Very True, Not At All True
Communication Skills	argue a case clearly, logically and convincingly	I am encouraged to express my opinion.	Often, Sometimes, Almost never and Never
Social and Co-operative Skills	develop a sense of responsibility for the well-being of others and for the environment	At school we look after each other. I help to keep the school tidy.	Very True, Somewhat True, Not Very True, Not At All True Often, Sometimes, Almost Never, Never.
Environment for Learning	(Additional to the Essential Skills)	I have enough time to complete my homework. School is a good place to be.	Often, Sometimes, Almost Never, Never Very True, Somewhat True, Not Very True, Not At All True

Table 5 presents some of the items, showing the skill group, specific skill and answer set associated. For example the skill “work effectively, both independently and in groups” is one of the Work and Study Skills. For students to develop this skill they need to have the opportunity to work on their own and in groups. If they never work on their own or conversely never get to work in groups, their ability to do so will be hindered. This led to the item “I work on my own, without help from others” (Every day, Most days, Sometimes, Almost never, Never) and the items, “I work as part of a group”, (Often,

Sometimes, Almost never and Never) and "At school I learn ways to work better in a group", (Very True, Somewhat True, Not Very True, Not At All True). The full final instrument is included in Appendix 7, and the items are also listed in their index groupings in Appendix 9.

In addition to the eight categories related to the eight Essential Skills, a ninth category was developed, called Environment for learning. This drew on research by Gilmore & Absalom (1995) which discussed elements of the school environment that helped or hindered learning, related to the Essential Skills of the New Zealand Curriculum. This included items such as "I have enough time to complete my homework", and "School is a good place to be", and addressed issues of temperature and noise in the classroom. These measures affect opportunity-to-learn in a general way. They are very similar in style and content to items used in the Improving School Effectiveness Project (ISEP), such as "I always like school" and "Teachers are always fair". (McCall et al., 2001)

Embedded in the instrument are items related to "Press for achievement" as advocated by Oakes (1989). These include items such as "I am encouraged to work well", and "I feel pleased with the work I do at school". These also reflect one of the three main performance indicators proposed by Gray & Wilcox (1995), the desired aspect of "pupils' satisfaction with their educational experiences". Similarly there are elements corresponding to another of Gray and Wilcox's performance indicators, namely pupil-teacher relationships. This is covered by items such as, "My teachers have time to help me", "Things are explained to me in a way I can understand", and "My teachers help me to learn."

An initial set of 137 items was created. The questions were pre-tested on a small group (n=3), and the wording altered where it was unclear. The items had a variety of response scales, including "Always/Usually/Sometimes/ Never" and "Very true/ Somewhat true/ Not very true/ Not at all true". For the pre-test and pilot study, the categories, "I don't know" and "Doesn't apply to me" were included to aid in the development of the instrument.

In order to establish content validity, the set of items was grouped according to the Essential Skill areas, and sent to several groups of experienced teachers and educators, including specialist teachers for learners with vision impairment. They were asked to consider, for each of the skill areas, the extent to which the questions covered the Essential Skills, – did they establish whether the learner had the opportunity to develop those skills and were there any gaps, overlaps or questions they would like to add? Overall, did they add up to the essence or intention of that particular skill set? The educators were also asked to comment on how appropriate the items would be for different age groups. The responses were very helpful in identifying ambiguous questions, repetitions and possible additions.

Analysis of the validity feedback led to the development of a set of 101 items that would make up the scales in the pilot test. To these were added questions on demographic and administrative details including gender, age, year at school, home language and whether there was a computer at home that they could use. This was then piloted, near the end of the school year, on four classes (79 useable responses) at a medium-sized high school (800 pupils) in a medium to low socio-economic area. Students were asked to think about their experiences at that school during that school year. I administered the questionnaire and noted the time taken, students' body-language, queries and comments, in order to improve the instrument further. The questionnaire also asked how the students found the questionnaire with regard to length, ease of understanding, ease of answering and whether or not it was interesting.

The pilot study was useful in uncovering potential sources of error. For example, students often gave the current year as their year of birth, and some students confused male and female. Consequently the later instrument asked for their age as well as their date of birth, and used the terms, boy and girl. As missing values or the choice of in-between responses would cause serious difficulties in analysis, I realised it was better to glance quickly over each response booklet as it was collected and get the student to correct mistakes and omissions at the time. Responses were anonymous, and summary results were provided to the school to acknowledge the contribution of the staff and pupils.

In order to get an indication of the consistency of responses, one class (n=23) was given parts of the questionnaire to answer again about two weeks later. Unfortunately this was done in the last week of the school year and their goodwill was exhausted. Several of the students did not complete the questionnaire, or seemed to just tick down one column. On average the students gave the same response that they had given previously 53% of the time, and were different by no more than one level of response 91% of the time. Their individual correlations ranged from 0.769 to 0. Some items provided very consistent responses. These included "School is a good place to be", "The types of sporting activities at school suit me," and "I have to look for my own information to complete my schoolwork." Other items were much less consistent: "I am encouraged to try new things, even if I am afraid," (eliminated) "The teachers and students respect each other," (eliminated), and "I look at different solutions to the same problem". (retained)

The instrument was refined in light of the pilot study, with some items removed and some altered, leading to the "final" set of eighty-seven items. Each item was examined, along with the range of responses given. The correlations between questions that should have been related were also examined. If questions relating to the same construct did not correlate, or had negative correlations, then this indicated that one or both of the questions may have been badly worded. Questions were

removed or edited if they were confusing, ambiguous, involved multiple concepts or were not well written.(Department of Statistics, 1992)

In the pilot study there were some items asking pupils to rate how often they took part in certain activities compared with the others in their class. These were confusing as they required the students to make judgments about other people's activities. This format was changed to a straight frequency format. Other items were too vague and did not give meaningful results. These included "I get practice speaking in various settings" and "We write for different purposes". One item, "We read the same type of books all the time" did not correlate with any other item. This was reworded as "We read a variety of material, such as newspapers, books, magazines, fiction and non-fiction."

An example of a question involving multiple ideas was, "I feel pleased when I have worked hard to complete a piece of work." This has complex ideas in it: "Do I complete work?", "Do I feel pleased when I complete work?", "Do I feel pleased when I have worked hard?" or "Is it only when I have worked hard and completed a piece of work that I feel pleased?" The responses to this were nearly all Often (40) or Sometimes (33) with only four responding Almost Never and no one selecting Never. Similarly "When I do badly at school I feel like giving up" was intended to test for persistence, but a student who seldom does badly at school may be unable to give an answer that indicates persistence. A "Never" response could mean they never do badly, or that they never feel like giving up.

Students asked for clarification about some of the items, and these items were examined closely and altered or removed if necessary. Examples of these are "We practise using numerical patterns", and "We use material presented in a mathematical way," both of which are hard to understand.

The refined set of items was arranged so that items from each skill set were spread throughout the questionnaire, and items with similar response sets were grouped together. This final set, named the Essential Skills Access (ESA) test, was then administered to a sample of over 1300 students, according to the sampling scheme described below. A full copy of the ESA test is in appendix 7.

4.4 The sampling scheme

The purpose of the sample was to establish a baseline for the indices related to opportunity to learn. This baseline would give an indication of the level and range of provision for "ordinary needs children" in New Zealand schools, with which to compare the provision for learners with vision impairment. For this reason the sample needed to be big enough to include a variety of schools. Factor analysis would be important in the construction of an instrument of this type, so this also guided the choice of sample size. As a general rule (see Hair #563 page 99) it is best to have at least ten subjects per variable, and a sample of over 1000 is thought to be "excellent". As there were about 100 variables, a sample of over 1000 would be sufficient for sensible use of factor analysis and similar multivariate techniques.

There was a limited time frame before the end of the school year in which to arrange and administer the questionnaire in schools. The experience of the pilot study indicated the need to administer the questionnaire in person in order to get the best response rate and quality. (This was later reinforced in the few cases where it was necessary to leave questionnaires to be completed under the supervision of the classroom teacher, which resulted in a poorer quality of response.)

Twenty schools were sampled. With twenty schools it was possible to cover urban and rural, co-educational and single-sex, and the full range of deciles (See Appendix 1 for a discussion on deciles). As the pilot study had showed up differences in scores between the year groups, one class was sampled from each of the three years at each school in the baseline study. This led to an estimated sample size of 20 schools × 3 classes × 25 pupils = 1500 pupils (actual size of 1300).

A purposive convenience sample was taken. The time and funding available allowed for sampling from twenty schools in three regions. Three regions were chosen: Canterbury, Auckland, and Waikato. The candidate schools were chosen in order to make the sample approximately representative of the population with regard to ethnicity, socio-economic background as indicated by the decile rating, school size and gender. If a principal did not wish the school to take part, as happened in five instances out of twenty-five, another school as similar as possible was chosen. The important aspects of the schools within the sample are summarised in Table 6.

Table 6. Characteristics of the twenty schools in the baseline sample.

School ID No	2002 Decile	School roll	Rural/City	Percentage Pakeha on the school roll	Percentage Maori on the school roll	Percentage other (Asian or Pasifika) on the school roll
A	4	400	Rural	88%	11%	1%
B(G)	6	400	City	90%	7%	3%
C(B)	7	1300	City	88%	8%	4%
D	9	300	Rural	91%	7%	2%
E	8	800	City	66%	4%	30%
F	5	500	City	83%	12%	5%
G	9	1000	City	84%	6%	10%
H	6	1100	City	66%	10%	24%
I	1	600	City	4%	17%	79%
J	2	1200	City	13%	42%	45%
K	1	400	City	1%	18%	81%
L(G)	10	2000	City	66%	5%	29%
M(B)	10	2000	City	59%	3%	38%
N	10	>2000	City	71%	3%	26%
O	5	650	City	54%	22%	24%
P	2	450	Rural	37%	40%	23%
Q	1	350	Rural	30%	70%	0%
R	1	300	Rural	37%	57%	6%
S	9	1400	City	82%	6%	12%
T	3	1100	City	64%	26%	10%

Note. “B” indicates a boys’ only and “G” a girls’ only school. The school rolls have been rounded to maintain anonymity.

The participating schools were from Auckland (7 schools), Waikato (4 schools) and Canterbury (9 schools). There were sixteen co-educational schools and four single sex schools, of which two were high decile (10) and two were medium decile (6 and 7). There were five rural and fifteen city schools. The schools were chosen as much as possible to obtain a representative sample overall with regard to ethnicity. Thus some schools had high Maori populations and others had low. On average the proportions were 60:20:20 (Pakeha:Maori:Other), whereas the population at that age group has the ratio 62:25:13. Only state funded secondary schools were included. The range of deciles of the schools was as follows (2002 deciles):

Table 7. The number of schools in the baseline sample from each decile.

Decile	1	2	3	4	5	6	7	8	9	10
Schools	4	2	1	1	2	2	1	1	3	3

More schools were sampled from the extremes of the range (deciles 1,2,9 and 10) as it was thought that this is where most variation between deciles would appear. See Appendix 1: Explanation of the Decile system for further explanation.

School size may well affect the opportunities that students have. Thus schools of various sizes were included. It was not practical to go to very small schools as there would not be sufficient pupils at each year level to get a worth-while sample. The intention was to get a sample that roughly represented the population of New Zealand to compare with the learners with vision impairment.

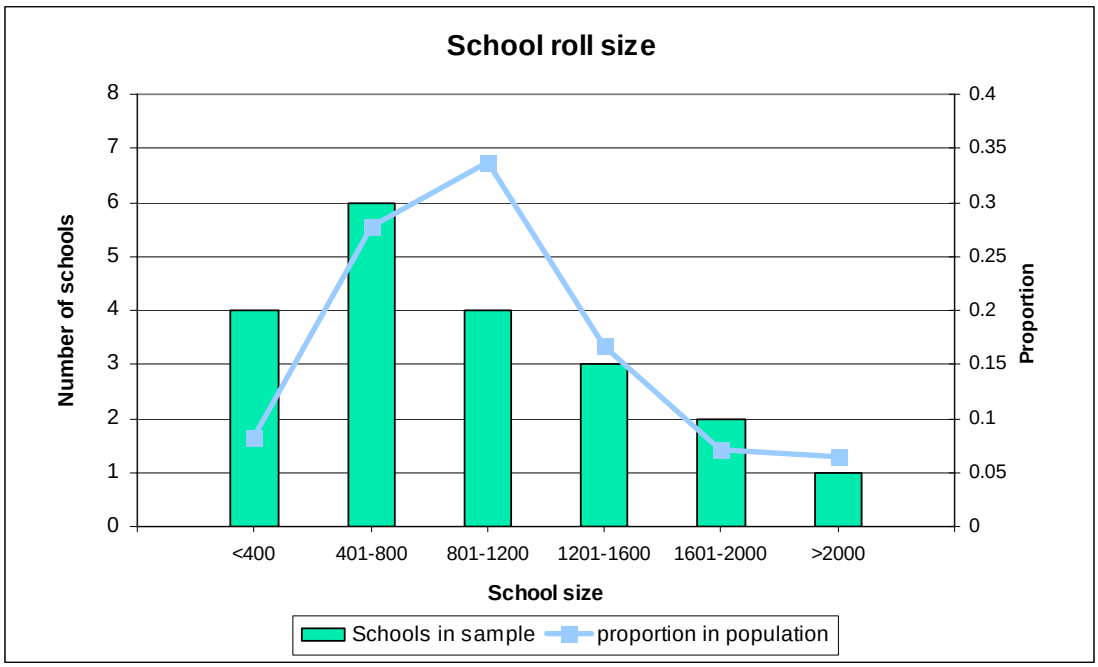


Figure 5. School roll sizes in the population and the ESA sample.

Figure 5 illustrates the school roll sizes in the sample, compared with the population. The solid line in Figure 5 shows the proportion of the population of secondary school students in years 9 to 15 by size of school. About 8% of such students are in schools of fewer than 400 pupils, while 34% of high school students are in schools with between 801 and 1200 pupils. The green bars show the number of schools in the sample within each size category. There is not a perfect fit, and schools under 400 are over-represented, while there are too few schools in the 801 to 1200 range. This is partly due to the

limited number of schools from which to pick, with a large number of criteria to satisfy. Each size range was represented, so it was possible to explore some effects of school size.

In each school I administered the survey to a Year 9, a Year 10 and a Year 11 class, (students typically aged 13 to 16 years – the first three years of secondary school). The classes were selected from those available in a core subject (English, Mathematics, Science, Social Studies) at the time of the visit. Principals were encouraged not to choose "the better classes", but where there was a choice, to choose according to the alphabetical placement of the teacher's name.

My experience as a secondary school teacher was useful. In a few schools I was left to administer the questionnaire for a few minutes without the teacher present. I really enjoyed meeting the students and talking to them. They were interested in the purpose of the work. The teachers generally were supportive and interested. I also found it instructive to note how different schools "felt". There were some schools where the staff and pupils were obviously happy to be there. In another school the year eleven class was quite obstructive, which was not helped by a drug-dog visit in the middle of administering the questionnaire. I later received a written apology for the students' behaviour.

The survey was well received by the students, possibly as an escape from "work", and they seemed pleased to be asked their opinion. The questionnaire took between 15 and 20 minutes to complete, and was well within the reading level of all but a few of the respondents. My presence at nearly all of the classes encouraged a high quality of response. The response rate was 100%. There were 1388 returned questionnaires. There were 88 exclusions: those from students outside the year range (4), overseas fee-paying students (51), students with special educational needs (11), students who had changed schools recently (20), and incomplete responses (2). The resulting sample had 1300 observations, about 600 from girls and 700 from boys.

Frequency data for the individual school and for the whole reference group was sent to each participating school in acknowledgement of their contribution. The summary data for the whole sample is given in Appendix

Chapter 5: Results from the Baseline sample

The purpose of this chapter is to report on the results of statistical analysis that explores the validity of the instrument and its usefulness in measuring received curriculum or opportunity to learn skills. The implications of these results, particularly with regard to validity, will be discussed in Section 5.8.

This chapter contains:

- An explanation of the computation of the indices and the decisions as to which items were included and excluded.
- A comparison of the ESA indices based on the Essential Skills, with indices generated from factor analysis on the data as a whole.
- An analysis of aggregated school results with Education Review Office (ERO) reports, external examination results and decile groups.
- A comparison of schools and their different effects.
- An exploration of the effect of gender on opportunity-to-learn.
- A report on more complex modelling using a multi-level modelling package, that reflects the hierarchical nature of the data.

5.1 Developing the indices

Items from the questionnaire were grouped according to the Essential Skills of the New Zealand curriculum, in order to produce a set of indicators of educational opportunity that would be easily interpreted. These groups of items were tested for consistency. The values for Cronbach's alpha

ranged from 0.58 to 0.75, for the nine indices. Each item that did not fit well with the other items in its skill set was examined, and those which did not tap the same construct were removed from that index. For example the item, "I read independently", was excluded from the intended Communication Skills index as it reduced the consistency of the index, which included items like "I am encouraged to express my opinion", "I express my feelings through writing", and "We are encouraged to share our ideas in class." The idea expressed in "I read independently" correlated more highly with "I work on my own, without help from others" which was intended as part of the Work and Study Skills index. It suggests that in the students' understanding of the phrase "I read independently", the concept of independence was stronger than the concept of reading. This may indicate another construct to be developed in a future instrument, relating to the students' independence.

The resulting alpha scores, numbers of items and some examples of items from each of the nine indices are given in Table 8. Appendix 9 contains a full list of included and excluded items, grouped according to the Essential Skills.

Table 8. Reliability data for the nine indices, with examples of items from each index.

Index name	Measure of reliability (Cronbach's alpha)	Number of items in the index	Examples of items in the index
Communication Skills (Com)	0.66	6	I am encouraged to express my opinion. I express my feelings through writing.
Numeracy Skills (Num)	0.63	8	I use mathematical skills in subjects other than maths. We use graphs and charts to express information.
Information Skills (Inf)	0.66	8	I use computers to find out information. I use the resources in the school library or information centre.
Problem-solving Skills (Prob)	0.68	8	I try out my own ideas. I am asked to think about how I can improve my work.
Self-management and Competitive Skills (Self)	0.75	7	I feel pleased with the work I do at school. I am encouraged to stand up for my rights at school.
Social and Co-operative Skills (Soci)	0.76	10	I have opportunities to make friends. The others in my class help me to learn.
Physical Skills (Phys)	0.71	8	I learn and develop physical skills at school. The types of sporting activities at school suit me.
Work and Study Skills (Work)	0.74	9	It is important to hand in my schoolwork on time. Things I learn outside of school time are useful at school.
Environment for Learning (Env)	0.67	6	School is a good place to be. My teachers have time to help me.

5.2 Comparison with the results of Factor Analysis

The Essential Skills were used as the grouping mechanism for the items as it made the scores easily interpreted. In order to explore the possibility of a better set of factors, a factor analysis was performed on the seventy items used to generate the indices. There was no compelling factor structure that arose from the data. To provide a comparison with the chosen index structure, a structure with nine factors was generated using factor analysis. Oblique rotation was used as there was no implication that the factors should be orthogonal. A full listing of the results is given in Appendix 8. Some of the resulting factors were very similar to the ones based on the original groupings. One factor grouped items related to Numeracy Skills, one factor was concerned with the Physical Skills and one related to Social Skills. Others could be loosely labelled as relating to satisfaction, contribution, work and equipment, while two of the groupings did not appear to follow any particular construct. The Cronbach's Alpha values for the groups determined by factor analysis ranged from 0.51 to 0.81, with the total for the nine indices being identical to that for the original groupings. The indices varied greatly in the number of constituent items, ranging from four items in two of the indices, to one index comprising sixteen items. There was little to be gained in terms of reliability by using the indices developed using factor analysis and much to be lost with respect to interpretability, so the Essential Skills indices were used as originally developed.

The nine individual index scores were calculated for each pupil by taking the mean values of the component item scores. In the few cases (less than 1% of the indices calculated) where there was missing data, the average was taken over the smaller number of items. This is equivalent to using the mean of the other item scores to replace a missing value. The scores were then standardised over the whole sample to a mean of 0 and a standard deviation of 1. Thus an index score of 0 indicates that the student's perceived access to that skill area was the same as the average for that skill area for the whole sample. A score of -0.5 for Communication Skills indicates that the student is 0.5 of a standard deviation below the mean in opportunity-to-learn Communication Skills for the whole sample. The scores are thus relative to the sample as a whole. The nine mean index scores for each of the twenty schools were calculated and used in further analysis.

5.3 Placing the ESA scores in context

The mean ESA scores for the schools, measures of opportunity-to-learn, were analysed with respect to school-level measures of school quality, academic achievement and socio-economic background.

The source of a measure of quality was the Education Review Office (ERO), the government department which reviews all New Zealand schools approximately every three years and reports publicly on the quality of education and care of the pupils. The ERO reports are available on the internet and parents are encouraged to read these reports when making decisions about what school their child attends. I assigned a numerical (6-point) score to each school based on the summary report closest in time to when the survey was implemented. A high score (10) indicated a glowing report, while the lowest score (5) indicated that there were problems at the school which necessitated another review in twelve months. These scores give an independent measure of what could be called the quality of the schools. Clearly there is a subjective element, both in the evaluation by ERO and by the assignment of the grade according to how favourable it seemed. This does give a limited indication of school quality, however.

The variable, NCEA pass-rate, is related to a school's academic success, and was developed in this instance by dividing the number of students achieving the National Certificate of Educational Achievement (NCEA) level 1 in their third year of high-school by the total school roll. It would be preferable to divide by the number of students in their third year of schooling, but this figure was not readily available, so the school-roll was used as an approximation. The NCEA pass-rate gives an indication of the school's overall academic success. The number itself is not easily interpreted, but it is the relative value for each of the twenty schools in the sample that is of interest. The figures for the number of students gaining the literacy and the numeracy requirements were also available and variables were generated by dividing these values also by the roll-size. These were (as expected) highly correlated with the overall pass-rate.

The decile is the value assigned by the Ministry of Education to the school indicating degree of socio-economic disadvantage. A full explanation of how the decile rating is assigned is given in Appendix 1. A low decile value is associated with a school of greater disadvantage, which can be associated with low socio-economic status.

There are six pair-wise relationships to examine between decile (a measure of socio-economic status), the ERO score (a measure of school quality), NCEA pass-rate (a measure of academic success) and the ESA Indices (measures of Opportunity-to-learn).

ERO scores – measures of school quality

There was no significant correlation between the decile measure and the ERO score (r=0.3). Interestingly, for this sample, both the highest and the lowest ERO scores occurred in Decile 1 schools. Similarly there was no significant correlation between the overall NCEA pass-rate and the ERO score (r=0.21), though there was a positive correlation (r=0.45) between the literacy requirement pass-rate and the ERO score. There is, in contrast, a strong correlation (r = 0.85) between decile and pass-rate, which confirms the association between socio-economic background and examination results. It may seem surprising that an indicator of school quality was not correlated with examination results. This could be because the dominant influence on examination results is socio-economic status, which is not related to the ERO score. The Education Review Office can and does rate some low decile schools highly, if the schools are considered to be providing a high quality learning experience for the students. This may not necessarily relate to examination results, as the ERO takes a wider view of the role of the school, and takes into account the socio-economic background of the students.

School quality and Opportunity-to-learn

The correlations between the ERO scores and the ESA indices were all positive, indicating that a high mean score in each of the indices for educational opportunity is related to a good ERO report. The positive correlation was significant between the ERO score and the school mean values for the indices: Information Skills (r = 0.683, p = 0.001), Numeracy Skills (r = 0.566, p = 0.009) and Communication Skills (r=0.460, p=0.041). These three skill areas are the main focus in New Zealand schools, and the schools which scored highly in them tended to have more glowing ERO reports.

Table 9 gives the correlations between the school means for the nine indices, and the ERO score, decile and NCEA results.

Table 9. Correlations of school mean index values with other context variables. Sample size = 20 schools.

Index of opportunity-to-learn (ESA)	ERO School Quality	Decile Socio-economic status	NCEA results Academic achievement
Communication Skills	**r = 0.46***	r = -0.34	r = -0.15
Numeracy Skills	**r = 0.57****	**r = 0.59****	**r = 0.68****
Information Skills	**r = 0.68****	r = 0.16	r = 0.25
Problem Solving	r = 0.23	**r = -0.55***	r = -0.37
Self-management	r = 0.34	**r = -0.59****	r = -0.42
Social and co-operative Skills	r = 0.28	r = -0.26	r = -0.15
Physical Skills	r = 0.18	**r = -0.53***	**r = - 0.47***
Work and Study Skills	r = 0.41	r = -0.19	r = -0.00
Environment for learning	r = 0.35	r = -0.41	r = -0.18

Note. Significant correlations are given bold. Shaded squares indicate a negative relationship.** indicates $p<0.01$, * indicates $p<0.05$.

Academic results and Opportunity-to-learn

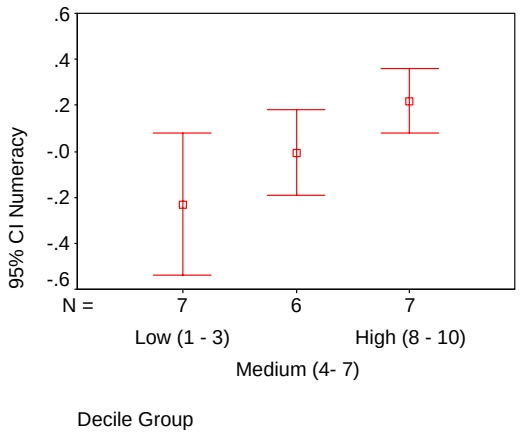
The correlations between the ESA indices (opportunity-to-learn) and the school NCEA pass-rates (academic results) are interesting. The score in Numeracy Skills is positively correlated (r= 0.68) with NCEA pass-rate, while the score in Physical Skills is negatively correlated (r= -0.47) with NCEA pass-rate. Schools which are not particularly academically focussed may place more emphasis on physical skills, with initiatives such as sports academies. The result for Numeracy Skills may be reflecting the decile effect, as the index for Numeracy Skills has a positive correlation with decile, and Physical Skills has a negative correlation. The NCEA Literacy pass-rate did not correlate significantly with any of the ESA indices. The NCEA Numeracy pass-rate was negatively correlated with Self Management Skills (r = -0.46) and Physical Skills (r = -0.50).

Socio-economic status and Opportunity-to-learn

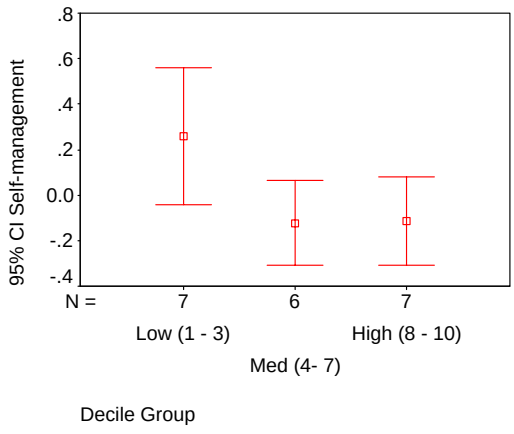
There were four significant correlations between the decile group and the opportunity-to-learn (ESA) scores. These are listed in Table 9. Numeracy Skills are positively correlated, while the correlations were negative for Self-management, Problem Solving, and Physical Skills. It appears that schools in lower deciles may provide better opportunity-to-learn in some skill areas, even though this is not reflected in overall examination results. In higher decile schools there may be a stronger emphasis on academic achievement, with less emphasis on aspects like Self-management or Physical Skills.

The effect of socio-economic background on opportunity-to-learn was also explored using Analysis of Variance, in addition to the correlations. The mean index values for the schools, grouped into the three decile groups, were compared for the nine indices. Three indices, Numeracy Skills, Self-management Skills and Physical Skills, showed a significant difference between the groups, but the pattern was not consistent. For Numeracy Skills, the group of schools with High socio-economic status (High decile) scored higher than schools in Low deciles (p= 0.009), while for Self-management and Competitive Skills, the Low decile group scored higher than the group of Medium decile or High decile (p= 0.04). For Physical Skills the group of Low decile schools scored higher than High decile (p= 0.04). The error bars for the 95% confidence intervals for these indices are shown in Figure 6. Similar graphs for each of the nine indices are included in Appendix 11.

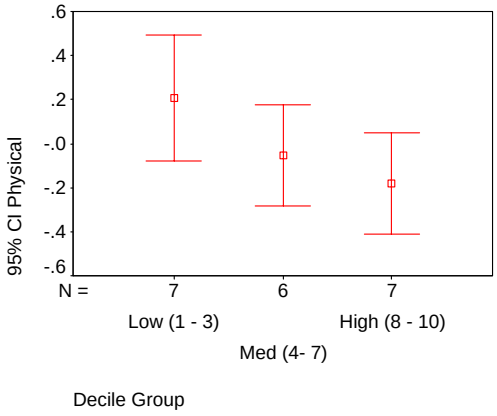
Numeracy Skills



Self-management Skills



Physical Skills



Environment for learning

(no significant effect due to decile group)

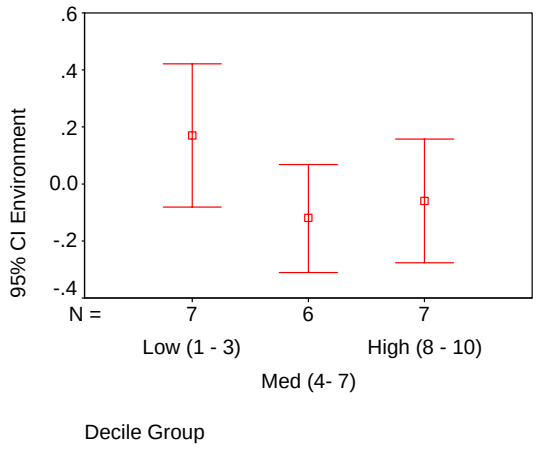


Figure 6. Index Scores by Decile Groups of schools

The grouping of the ten deciles into the three decile groups is somewhat arbitrary. Another grouping was tried, comparing the average ESA scores for each school classified as low decile (1 to 3) with medium to high decile schools (4 to 10). The results were similar to those just reported. The Low decile schools had a lower mean score for Numeracy Skills (the Low decile mean score was 0.35 lower, with a p-value of 0.01), and a higher mean for Self-management Skills (difference = 0.38, p-value = 0.004) and Physical Skills (difference = 0.33, p-value = 0.015). In addition the low decile schools had a higher mean for Problem-solving Skills (difference = 0.26, p-value = 0.021) and for Environment for Learning (difference = 0.26, p-value = 0.028) when compared with the medium/high group of schools.

In summary, there is no evidence of a relationship between the decile rating (indicative of the school's socio-economic status) and opportunity-to-learn Communication Skills, Information Skills, Social and Co-operative Skills and Work and Study Skills. Higher decile schools appear to have better opportunity-to-learn Numeracy Skills. Lower decile schools are associated with better opportunity-to-learn Self-management Skills, Physical Skills, Problem-solving Skills and a better Environment for Learning. These results are only indicative, however, as only twenty schools were sampled.

5.4 School contribution

A pressing question in the area of School Effectiveness, is how much variation in student performance can be attributed to the contribution of the individual school. It is of interest to know if this set of indices, the ESA test, can help to inform this line of research. In this study, two-level hierarchical modelling (Goldstein, 1997) was used to explore the school contribution to educational opportunity.

We begin with a simple model:

$$\begin{aligned} score_i &= \beta_0 + e_i \\ e_i &\approx N(0, \sigma^2_{e_i}) \end{aligned} \qquad (1)$$

where subscript *i* takes the values 1 to 1300 for the individual pupils, e_i is the error term or residual for the *i* th pupil and β_0 is the mean score for the 1300 pupils.

Because the index scores have been standardised to a mean of zero and a standard deviation of 1, β_0 has a value of zero and the variance of the residuals, $\sigma^2_{e_i}$ = 1. The error for the individual pupil, e_i, is the difference between the pupil's score and the mean score for the sample as a whole. See Rasbash, Steele, Browne, & Prosser (2004, p 28).

A two level random effects model with no explanatory variables can be written as

$$\begin{aligned} score_i &= \beta_{0j} + e_{ij} \\ \beta_{0j} &= \beta_0 + u_{0j} \\ u_{0j} &\approx N(0, \sigma^2_{u_0}) \\ e_{ij} &\approx N(0, \sigma^2_{e_{ij}}) \end{aligned} \qquad (2)$$

where

β_{0j} is the mean value for school *j*.

e_{ij} is the residual term for pupil *i* at school *j*.

β_0 is the overall mean (=0 in this case)

u_{0j} is the school effect and is assumed to be a random variable.

$\sigma^2_{u_0}$ is the variance attributable to the school effect.

u_{0j} and $\sigma^2_{u_0}$, the level 1 and 2 residuals, are assumed to be independent. (Raudenbush & Bryk., 2002, p. 35)

The variance partition coefficient (VPC) shows the relative importance of the school effect in explaining the variation between students by measuring the percentage of variation explained by a school. The formula for the VPC is

$$VPC = \frac{\sigma^2_{u_0}}{\sigma^2_{u_0} + \sigma^2_e} \left(= 1 - \frac{\sigma^2_e}{\sigma^2_{u_0} + \sigma^2_e} \right) \quad (3)$$

The denominator in this case, $(\sigma^2_{u_0} + \sigma^2_e)$ is 1 because the scores have been standardised to a variance of 1. This was confirmed in the empirical results.

The VPC for each index is thus σ^2_{u0}, which can be interpreted as the proportion of the total variance in that index that is attributable to school effect. The values for the VPC for each of the indices are listed in the second column of Table 10. For each of the indices the school contribution was estimated to explain between four and seven percent of the total variation.

Table 10. Proportion of variation explained by school effect using two-level modelling or Ordinary Least Squares regression.

Dependent Variable is the index for:	**VPC = σ^2_{u0} Proportion of variation due to school, using multilevel modelling**	**R^2 from single level regression model (fixed effects)**
Communication	0.051	0.068
Numeracy	0.069	0.083
Information Skills	0.056	0.069
Problem-solving	0.043	0.059
Self-management	0.071	0.086
Social	0.075	0.078
Physical	0.070	0.081
Work and study	0.040	0.04
Environment	0.046	0.04

It is also possible to model the school effect using a single level regression model with dummy variables for the schools, using Ordinary Least Squares (OLS). The equation takes the form

$$score_i = \beta_0 + \beta_1 \text{school\_1} + \beta_2 \text{school\_2} + ... + \beta_{19} \text{school\_19} + e_i \quad (4)$$

where the dummy variable school_j takes the value 1 if pupil i attends school j and 0 otherwise.

The values of the coefficient of determination (R2 or 1 - σ_e^2) from such an OLS model were similar to the VPC values from the two-level model. These are also listed in Table 10 for comparison.

The difference between the two model types is the assumption of fixed versus variable effects. In the single level model (OLS) the school effects are treated as fixed, assuming that there are twenty different alternatives, and all of them are represented in the data. Fitting the model involves estimating the coefficient for each school. In the two-level model, the school effect is assumed to be a random variable, for which there are twenty values sampled.

From these results we can conclude that the ESA scores appear to be useful in identifying a school effect.

Illustrating school strengths and weaknesses

Another issue in School Effectiveness Research is measuring and reporting effect size in a meaningful way. A way to examine individual school effects would be to identify for each school when the average index value is significantly higher or lower than the average for the whole baseline sample. If there was no school effect, and all schools were equally effective at providing opportunity-to-learn to their students, then there would be no variation between groups. However, because of sampling/measurement error, we could expect about one out of twenty schools (corresponding to a confidence level of 95%) to have a confidence interval not including zero, even if there was no underlying difference in the population. Figure 7 shows the 95% error bars for the mean values for each school (x-axis) for the indices for Communication Skills, Numeracy Skills, Social and Co-operative Skills and Physical Skills. For each index there are several schools significantly above and several significantly below the mean of zero. The schools are displayed in increasing order of decile[2]. (Similar to Low to High Socio-economic status.)

[2] The number in the school label indicates the decile. The school is identified with the ID letter code, followed by decile, then type-code (G, B, blank). Thus School B6G is a decile 6 girls school, and school I1 is a decile 1 co-educational school.

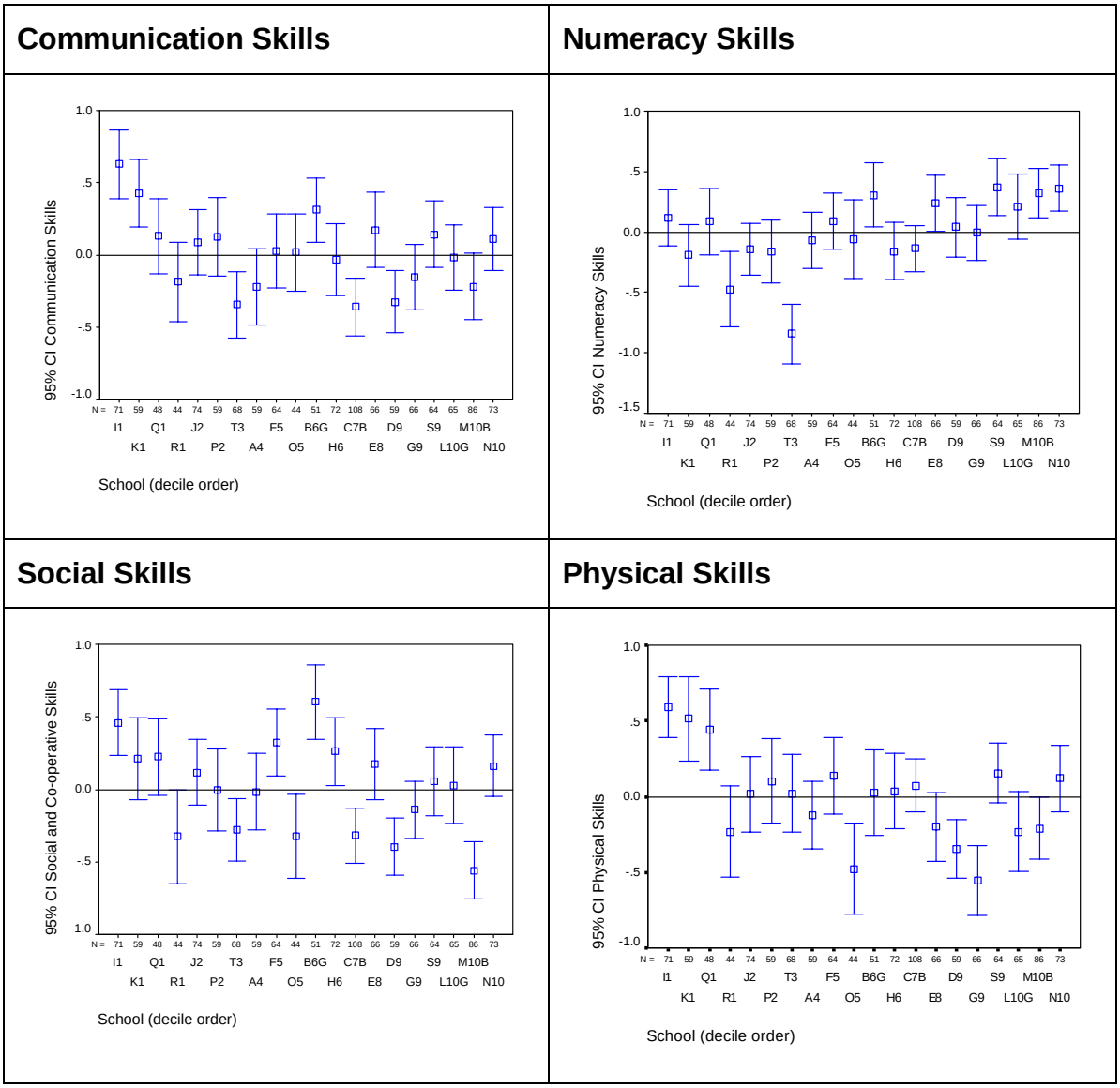


Figure 7. 95% Error bars for mean index scores by school in ascending decile order

In Figure 7 it is apparent that for Communication Skills the means for Schools I1, K1 and B6G are significantly higher than zero, the baseline mean. School T3 is significantly below average for Communication, Numeracy and Social Skills. In the Social Skills index, R1, T3, O5, C7B, D9 and M10B are all below the mean. These graphs show the variation between schools for each of these index values. Principals may wish to use this type of information for identifying relative strengths and weaknesses in their school.

Another way to display school mean ESA scores is by listing which means are above or below the group mean, as shown in Table 11. A number 1 in a cell indicates a mean which is statistically

significantly above the average, and a -1 indicates a mean below the average. A blank cell indicates that the school average is close to zero, the mean for the whole sample.

Table 11. School index score means that are significantly higher or lower than the average.

School	Decile	Number above average	Number below average	Com	Num	Inf	Prob	Self	Soc	Phys	Work	Env
I	1	8	0	1		1	1	1	1	1	1	1
K	1	5	0	1			1	1		1		1
Q	1	5	0			1	1	1		1		1
R	1	0	3		-1	-1			-1			
J	2	0	0									
P	2	1	0				1					
T	3	0	5	-1	-1	-1		-1	-1			
A	4	0	3					-1			-1	-1
F	5	1	0						1			
O	5	0	6			-1		-1	-1	-1	-1	-1
B(G)	6	3	0	1	1				1			
H	6	1	0						1			
C(B)	7	0	4	-1			-1	-1	-1			
E	8	1	0		1							
D	9	0	6	-1				-1	-1	-1	-1	-1
G	9	0	3					-1		-1		-1
S	9	1	0		1							
L(G)	10	0	0									
M(B)	10	2	4		1	1	-1	-1	-1	-1		
N	10	3	0		1	1					1	

Schools A, C, D, G, M, O, R, and T all have three or more indices with the average value below the sample mean, while schools B, I, K, N and Q have at least three indices with the average above the mean for the sample as a whole. Only in school M is there a mixture of average scores above and below the mean, and in schools J and L there are no index values above or below the mean. This information may also be of use to principals in deciding where to focus attention.

5.5 Gender effect

Over the whole sample there was a difference between the mean scores for girls and boys for most of the indices. The mean values were statistically higher for girls than boys ($p < 0.05$) for all the indices except for the Physical Skills index, where there was no significant difference. The difference between girls and boys was greatest for Communication Skills and Social and Co-operative Skills, where the score for girls was about half a standard deviation higher than that for the boys. The values for the differences between the means for the girls and boys are listed in the top row of Table 12.

Having found this gender effect overall, it was then interesting to look at how much the differences within the individual schools varied between schools. The mean index scores for boys and for girls were calculated for each of the sixteen co-educational schools. In four schools there was no difference between the boys and the girls for any of the indices. For two schools five or six mean index scores were higher for the girls than for the boys. The mean index score was higher for girls than boys in Communication Skills for nine of the sixteen schools. In one school the boys, on average, scored higher than the girls for physical skills, and in one for environment.

Table 12 shows the difference between the mean ESA scores for the girls and for the boys in each of the sixteen co-educational schools in the sample. A positive difference indicates that the girls scored more highly than the boys.

Table 12. Statistically significant mean differences in index scores by gender for the sample as a whole and for each of the sixteen co-educational schools, listed in ascending decile order.

	Com	Num	Inf	Prob	Self	Soc	Phys	Work	Env
Whole sample	0.45 (0.000)	0.19 (0.000)	0.23 (0.000)	0.15 (0.006)	0.25 (0.000)	0.40 (0.000)	0.05§ (0.38)	0.24 (0.000)	0.11 (0.050)
School									
I1							-0.48 (0.02)		
K1		0.64 (0.01)							-0.65 (0.04)
Q1									
R1	0.80 (0.00)		0.91 (0.00)		0.61 (0.03)	0.67 (0.04)		0.78 (0.03)	
J2									
P2	0.69 (0.01)								
T3									
A4			0.59 (0.04)						
F5	0.95 (0.00)	0.58 (0.01)	0.49 (0.05)	0.66 (0.01)	0.46 (0.05)	0.48 (0.04)			
O5	0.90 (0.00)							0.58 (0.04)	
H6	0.52 (0.04)	0.50 (0.04)							
E8	0.62 (0.02)		0.49 (0.03)			0.52 (0.03)			
D9									
G9	0.48 (0.05)								
S9	0.45 (0.05)					0.53 (0.03			0.49 (0.05)
N10	0.51 (0.02)				0.45 (0.04)				

Note. The number in parentheses below the difference score is the significance level for the null hypothesis that the difference between the means is zero. The blue shaded cells indicate negative values – the mean for the boys is significantly higher than for the girls. § indicates that the difference is not statistically significant in this cell – the value is included for completeness.

5.6 More complex modelling

One way of assessing the usefulness of the instrument is by exploring the relationships between the index values and various other factors. This was done using multilevel modelling. The models included both school-level variables (such as decile or location) and student-level variables (including gender and whether they have access to a computer at home), with the dependent variables being the index values. The general model is presented, then a discussion of the effects of each of the potential predictor variables. All of the coefficients for the nine models are given in Table 13.

General model

The general model can be expressed as follows:

$$\begin{aligned} indexscore_{ij} = {} & \beta_0 + \beta_1 gender_{ij} + \beta_2 computer_{ij} + \beta_3 year\_10_{ij} + \beta_4 year\_11_{ij} \\ & + \beta_5 language\_Pasifika_{ij} + \beta_6 language\_Asian_{ij} + \beta_7 language\_other_{ij} \\ & + \beta_8 school\_ERO_j + \beta_9 school\_decile_j + \beta_{10} school\_size_j \\ & + \beta_{11} school\_gender_j + \beta_{12} school\_centre_j + \beta_{13} school\_rural_j \\ & + u_j + \varepsilon_{ij} \end{aligned} \qquad (5)$$

for student i at school j.

ε_{ij} is the error term for student i at school j.

u_j is the error term for school j.

The coefficients were estimated using multi-level modelling. Multilevel modelling was explained in part on page 96 , where the simple model (Equation 1) was introduced.

Using the MLwiN package, the model is fitted as two equations with student level variables: gender, computer and year level, and school level variables: ERO score, pass-rate residuals and decile. The model is fitted using iterative generalised least squares (IGLS).

$$
\begin{aligned}
indexscore_{ij} &= \beta_{0j} + \beta_1 gender_{ij} + \beta_2 computer_{ij} + \beta_3 year\_10_{ij} + \beta_4 year\_11_{ij} \\
&\quad + \beta_5 language\_Pasifika_{ij} + \beta_6 language\_Asian_{ij} + \beta_7 language\_other_{ij} \\
&\quad + \beta_8 school\_ERO_j + \beta_9 school\_decile_j + \beta_{10} school\_size_j \\
&\quad + \beta_{11} school\_gender_j + \beta_{12} school\_centre_j + \beta_{13} school\_rural_j + \varepsilon_{ij} \\
\beta_{0j} &= \beta_0 + u_{0j}
\end{aligned}
\qquad (6)
$$

for student *i* at school *j*.

Predictor variables for other languages (not English, Pasifika or Asian), school size, school gender, school location, and city/rural were found not to be statistically significant. The results are summarised in Table 13 where the variables that were significant in the various models are listed with their associated p-values. The positive coefficients are shaded yellow and the negative coefficients are shaded blue. The non-significant (at $\alpha = 0.05$) coefficients are included for information, but are not shaded. Each of the variables is now discussed.

Table 13. Coefficients from multilevel models predicting the index values.

Dependent variable		Constant	Gender (Male=1)	Computer at home	Year_10	Year_11	Pasifika	Asian	School ERO score	Decile
Com	Coeff	-0.43	**-0.45**	0.12	**-0.15**	0.00	**0.39**	0.09	**0.09**	**-0.03**
	p	**0.05**	**0.00**	0.11	**0.02**	1.00	**0.00**	0.44	**0.00**	**0.01**
Num	Coeff	-1.00	**-0.23**	**0.25**	-0.09	0.04	0.16	0.10	**0.09**	**0.04**
	p	**0.00**	**0.00**	**0.00**	0.14	0.60	0.17	0.41	**0.01**	**0.01**
Inf	Coeff	-1.08	**-0.28**	**0.32**	**-0.20**	-0.10	**0.29**	**0.50**	**0.13**	-0.01
	p	**0.00**	**0.00**	**0.00**	**0.00**	0.16	**0.01**	**0.00**	**0.00**	0.72
Prob	Coeff	-0.16	**-0.15**	0.14	**-0.20**	-0.09	**0.38**	**0.25**	0.05	**-0.04**
	p	0.50	**0.01**	0.08	**0.00**	0.19	**0.00**	**0.03**	0.06	**0.00**
Self	Coeff	-0.33	**-0.26**	0.10	**-0.20**	**-0.24**	**0.66**	**0.45**	**0.09**	**-0.04**
	p	0.77	**0.00**	0.20	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Social	Coeff	-0.15	**-0.36**	0.08	**-0.24**	**-0.36**	**0.49**	0.10	0.07	-0.02
	p	0.62	**0.00**	0.31	**0.00**	**0.00**	**0.00**	0.39	0.06	0.16
Phys	Coeff	-0.08	0.02	-0.01	**-0.33**	**-0.66**	**0.55**	-0.09	0.07	**-0.03**
	p	0.79	0.74	0.86	**0.00**	**0.00**	**0.00**	0.42	0.06	**0.02**
Work	Coeff	-0.42	**-0.26**	0.09	**-0.17**	-0.13	**0.42**	0.16	**0.07**	-0.01
	p	0.10	**0.00**	0.25	**0.01**	0.06	**0.00**	0.17	**0.02**	0.59
Env	Coeff	-0.42	**-0.13**	**0.20**	**-0.27**	-0.09	**0.44**	**0.23**	**0.07**	**-0.03**
	p	0.10	**0.02**	**0.01**	**0.00**	0.22	**0.00**	**0.05**	**0.02**	**0.01**

Note. The shaded cells indicate that $p<0.05$.

Gender

As shown in Table 13, the results for the multilevel modelling with regard to gender confirm the results of the previous analysis. For all the indices other than **physical skills**, the coefficient for **gender** (=1 for a boy, 0 for a girl) was significantly negative implying girls have higher opportunity-to-learn. For **Communication Skills** the coefficient for **gender** was -0.45, with a 95% confidence interval of (-0.56, -.34). As the indices are standardised to a mean of zero and a standard deviation of one, this is interpreted as showing that, all other things being equal, a boy will have about half a standard deviation lower perceived opportunity-to-learn Communication Skills than a girl in similar circumstances. In terms of the raw scores, for Communication Skills, this equates to just over one out of the six items in the index being answered one response category lower. For example, the item "I express my feelings through writing", with the response alternatives of "Often", "Sometimes", "Almost Never" and "Never" is part of the Communication Skills index. Responding with "Almost Never", rather than "Sometimes" to this item scores one point lower in the raw score, which equates to a drop in the standardised score of 0.4.

Year level

As it was not assumed that the level of opportunity-to-learn would have a linear relationship with year level, this was coded as two categorical variables, with Year 9 as the reference category. In general the perceived access was lower for year 10 students than for Year 9 students. Year 10 is notoriously a difficult year for students and their teachers. The first excitement of a new school has worn off, but the external examinations are still over a year away. This general attitude to school may affect the students' perception of opportunity-to-learn, as is shown by the coefficients shown in Table 14. For eight of the indices, there is a negative coefficient for the variable Year_10, meaning that, for instance, a student in Year 10 has 0.33 standard deviations less access to Physical skill development than the equivalent year 9 student. This equates to answering just over one of the eight questions in the Physical Skills index one response category lower.

For six of the indices this difference does not exist in year 11, and there is no significant difference from zero – that is students from Year 9 and Year 11 have similar scores. There is, however, a big difference in the Year 11 coefficient for Physical skills, with a high negative value (-0.66). This implies that a student in Year 11 has 0.66 standard deviations lower opportunity-to-learn Physical skills than a similar year 9 student. (Over two questions lower by one response category.) This is

largely because in several of the schools it was not compulsory for students to take Phys Ed at Year 11, whereas it is compulsory at all schools for Years 9 and 10.

Table 14. Effect of Year level on opportunity-to-learn with coefficients in decreasing order of magnitude.

	Coefficient of Year 10	Coefficient of Year 11
Physical Skills (Phys)	-0.33	-0.66
Social and Co-operative Skills (Soci)	-0.24	-0.36
Self-management and Competitive Skills (Self)	-0.20	-0.24
Environment for Learning (Env)	-0.27	
Information Skills (Inf)	-0.20	
Problem-solving Skills (Prob)	-0.20	
Work and Study Skills (Work)	-0.17	
Communication Skills (Com)	-0.15	
Numeracy Skills (Num)	-0.09 (not significant)	

Note. Coefficients show comparison with Year 9.

Computer at home

The ESA test included the question, "Do you have a computer at home that you are allowed to use?". The purpose of the question was to ascertain if the level of computer availability at home affected the index values at all. The response was related to the socio-economic status of the school. Ninety-five percent of respondents in the High decile schools (8 – 10) and 89% in medium decile schools had access to a computer, whereas the percentage with access was 61% in low decile schools.

Table 15. Effect of computer at home on opportunity-to-learn, with coefficients in descending order of magnitude.

	Coefficient of Computer at home
Information Skills (Inf)	**0.32***
Numeracy Skills (Num)	**0.25***
Environment for Learning (Env)	**0.20***
Problem-solving Skills (Prob)	0.14
Communication Skills (Com)	0.12
Self-management and Competitive Skills (Self)	0.10

	Coefficient of Computer at home
Work and Study Skills (Work)	0.09
Social and Co-operative Skills (Soci)	0.08
Physical Skills (Phys)	-0.01

Note. * indicates that $p<0.05$.

This variable was a significant predictor for the indices for Information skills (Coefficient = 0.32), Numeracy skills (Coefficient = 0.24) and Environment for learning (Coefficient = 0.18). In each case having access to a computer at home increased the score in that index by up to 0.3 of a standard deviation. For Information skills, the relationship is not surprising, as the index includes items, "I use computers to find out information" and "I use the internet for schoolwork."

The correlation of computer access to score in the Numeracy Skills index may relate to use of any kind of equipment. In the factor analysis reported in Appendix 10 a factor described as "equipment" grouped together three of the information skills items and the item "I use a calculator in my work at school." This conceptual linking of calculators and computers may account for the link between Numeracy and a computer at home.

The reason behind the correlation between computer access and Environment for learning index is less clear. Two of the items, "Things are explained to me in a way I can understand", and "I have enough time to complete my homework" had significant positive correlations (r = 0.1) with access to a computer. Time to complete homework may be related to a stronger emphasis on learning in the home, which may also be related to computer access.

Ethnicity/language

There was no ethnicity question in the questionnaire, but rather a question asking what language was mainly spoken at home. English was the main or only language spoken in 80% of the cases. In thirty-one cases (2.4%), Maori was spoken either on its own, or with English. In 8.4% of cases a Pacific Island language was spoken, and Asian languages accounted for 6.3% of cases. These were not evenly distributed throughout the schools. Two schools had predominantly Pacific Island language speakers (60%) and two schools had over 20% speaking Asian languages. The data from this particular study is not very suitable for drawing any conclusions about ethnicity or language, independent of school, as the racial mix is very specific to the school and strongly related to the decile of the school. (Table 6 showed the ethnic make-up of the schools in the baseline sample.)

Notwithstanding these shortcomings, language spoken at home was included in the model as three categorical variables, **Pasifika**, **Asian** and **other**, with English as the reference category. The coefficient of the **other** variable was not significant in any of the models. Table 16 lists the coefficients of language spoken at home. The students who speak Pacific Island languages had a higher perceived opportunity-to-learn for all but Numeracy Skills. This may be an effect due to their attending two schools which are making particular efforts with their pupils, as part of a Ministry-funded initiative to improve low decile schools. It is not possible at this stage to isolate the effect of ethnic background from the school effect. In contrast, the students who speak Asian languages are generally in high decile schools. The coefficient for Asian language was significantly greater than zero for the models explaining opportunity-to-learn Information Skills, Self-management Skills, Problem Solving Skills and Environment for learning. This implies, for example, that a student from an Asian background has 0.5 of a standard deviation higher opportunity-to-learn Information Skills than a Pakeha student, all other things being equal. This is a larger effect than for gender. This also may be related to the school, but indicates a relationship that needs further investigation. The question arises of whether these students really do have greater opportunity-to-learn, or is it that they have lower expectations, or take better advantage of what is offered and thus identify more opportunity-to-learn.

Table 16. Effect of language spoken at home on opportunity-to-learn.

	Coefficient of Pasifika	Coefficient of Asian
Self-management and Competitive Skills (Self)	0.66*	0.45*
Physical Skills (Phys)	0.55*	-0.09
Social and Co-operative Skills (Soci)	0.49*	0.10
Environment for Learning (Env)	0.44*	0.23*
Work and Study Skills (Work)	0.42*	0.16
Communication Skills (Com)	0.39*	0.09
Problem-solving Skills (Prob)	0.38*	0.25*
Information Skills (Inf)	0.29*	0.50*
Numeracy Skills (Num)	0.16	0.10

Note. * indicates that $p<0.05$. The coefficients are relative to those who speak English at home.

School decile rating

The decile rating can be coded several ways – as an interval scale, or in categories, as explained in Appendix 1. Using the decile score as it stands, which implies that there is an interval scale, gives the following results: For the Numeracy Skills index, decile has a positive coefficient, 0.04 ($p=0.00$)

suggesting that higher decile rating (implies higher SES) is associated with increased access to learning Numeracy skills. Each grade of decile improves opportunity to learn Numeracy skills by 0.04 of a standard deviation, all other things being held constant. This compares with the coefficient of gender, which is 0.23 for the same index, implying that for Numeracy Skills the effect due to gender is similar to the effect of being in a school for which the decile rating is seven steps higher.

For all the other indices the coefficient of decile is negative, except for Work and Study Skills and Information Skills, for which the coefficients are not significantly different from zero. In decreasing magnitude, the indices with significantly negative coefficients for decile are Self-management Skills (coefficient = -0.06), Physical Skills (-0.05), Problem-Solving Skills(-0.05), Environment for learning(-0.04), Communication Skills(-0.04) and Social and Co-operative Skills (-0.02). This can loosely be interpreted as saying that the students at lower decile schools (greater disadvantage, lower socio-economic status) have higher perceived opportunity-to-learn in these areas, other things being equal.

To examine a possible non-linear effect, three categorical variables were formed to indicate the school decile band and the multi-level models fitted. Using the Medium band as the reference group, the coefficients were significant for Low decile for predicting the indices, Communication (0.19), Numeracy (-0.20), Problem Solving (0.26), Self-Management (0.37), Physical (0.25) and Environment for learning (0.32). The coefficient was significant for the High Decile band for the index for Social Skills (-.26). This can be summarised in Table 17, which displays the results from using decile as an interval scale, and the results from the use of three categories. For five of the nine models, the Low decile group has a positive coefficient, compared with the Medium and High groups.

Table 17. Coefficients of decile variables when predicting index scores in a two-level model.

Index	Coefficient of decile value (interval scale)	Interpretation of the coefficients of categorical variables for low, medium and high decile groups.
Communication Skills (Com)	-0.040**	**Low** decile group 0.19 higher than Medium or High*
Numeracy Skills (Num)	0.034**	**Medium or High** 0.2 higher than Low decile group*
Information Skills (Inf)	-0.011	No evidence of effect due to decile
Problem-solving Skills (Prob)	-0.051**	**Low** decile group 0.26 higher than Medium or High*
Self-management and Competitive Skills (Self)	-.062**	**Low** decile group 0.37 higher than Medium or High**
Social and Co-operative Skills (Soci)	-0.033*	**Medium or Low** 0.26 higher than High decile group*

Index	Coefficient of decile value (interval scale)	Interpretation of the coefficients of categorical variables for low, medium and high decile groups.
Physical Skills (Phys)	-0.051**	**Low** decile group 0.25 higher than Medium or High*
Work and Study Skills (Work)	-0.017	No evidence of effect due to decile
Environment for Learning (Env)	-0.044**	**Low** decile band 0.32 higher than Medium or High**

Note. * indicates $p<0.05$, ** indicates $p<0.01$ (two-tailed test)

The general conclusion is that there is often an effect on opportunity-to-learn due to the socio-economic background of the pupils in the school. However this effect varies between indices. The effect due to the decile is not strictly linear, and for most indices indicates that students from schools of greater disadvantage (low socio-economic status) have greater perceived opportunity-to-learn.

School location, type and school size

There was a possibility that schools might differ in terms of opportunity depending on the location: whether the school was in Canterbury, Auckland or the Waikato. There was no significant effect on any of the index values due to location. Similarly there was no difference between city and rural schools. As there were only two all-girls schools and two all-boys schools, there were not enough schools in each category to examine closely the effects of single sex education. The only significant coefficient occurred in the "Social and Co-operative Skills" index, where the coefficient was -0.28 for all-boys schools. This indicates that boys at an all-boys school scored an average of 0.28 standard deviations lower than their peers at a co-educational school, all other things being equal.

Two indices had significant coefficients for the variable for school size when modelled using OLS regression. They were "work and study skills" (coefficient is negative) and "environment for learning" (coefficient positive). This effect did not show up in multi-level modelling. From the analysis undertaken there is no clear evidence that school size affects opportunity-to-learn.

School ERO score

In some respects the school ERO score can be thought of as an outcome variable. However, the judgement of an external assessor on the quality of the school should be indicative of the actual school quality, which will affect the opportunity-to-learn for the students. The origin of the school ERO score has been explained previously in Section 5.3. It was a positive predictor for all indices except for "Problem–Solving Skills", "Social and Co-operative Skills" and "Physical Skills". The effect was

strongest for Communication Skills. It could be interpreted that a student would score opportunity-to-learn Communications Skills higher by 0.1 than a similar student in a similar school with an ERO score 1 point lower. (The ERO score ranged from 5 to 10, with higher meaning a better report.)

5.7 Internal consistency

The inter-relationships between the individual's scores in the nine indices were also examined. The correlations ranged from 0.25, between Numeracy Skills and Physical Skills, and 0.70, between Self-management Skills and Work and Study Skills. A factor analysis of the nine indices, grouped into four factors, placed Communication Skills, Problem-solving Skills, Self-Management Skills, Work and Study Skills and Social and Co-operative Skills together into one factor. Numeracy Skills and Information Skills formed the second factor, and Environment for Learning and Physical Skills were single variable factors. These behaved in an intuitively logical way. It makes sense that Numeracy and Physical skills would be least related, as they are not very similar. Self-management and Work Skills, with a correlation of 0.7, are conceptually similar, to the point that it is not clear to which of the two indices some of the constituent items belong. The SPSS outputs giving these results are given in full in Appendix 12.

5.8 Discussion on validity, contribution, future use and limitations

Validity

The purpose of this phase of the research was to develop a set of process measures, and to explore the usefulness and validity of asking the pupils about their experiences at school. The results reported in this chapter provide evidence of the validity of this approach, in preparation for using the indices in later analysis of learners with vision impairment. Validity can be classified into three main types, content validity, criterion-related validity and construct validity. (Cavana, Delahaye, & Sekaran, 2001; DeVellis, 1991). Each of these is reviewed with regard to the development of the instrument.

When considering content validity, we ask the question "Does the measure adequately measure the concept as based on the relevant literature, previous research or the opinion of experts?"(Cavana et al., 2001, p. 214) The literature review ensured that the instrument was allied with other educational instruments, and as described in Section 4.3, the items were examined by a panel of judges. These are the customary methods for ensuring content validity.

There is evidence of criterion-related validity when there is a relationship with some criterion, either currently or in predicting values. Differences between results for boys and girls, with boys scoring lower in the ESA indices except in the index for physical skills, are consistent with the findings presented in the educational literature as reviewed by Alton-Lee & Praat (2001). This provides evidence of concurrent criterion-related validity.

Construct validity is concerned with whether the instrument "behaves the way the construct it purports to measure should behave with regard to established measures of other constructs." (DeVellis, 1991, p.46) The ERO scores are a measure of school quality, and you would expect opportunity-to-learn to be positively correlated with school quality. The correlations between ERO reports and index values show that the indices reflect school quality as evaluated by an external authority. In the conceptual framework, the mechanism through which a school affects student learning is Opportunity-to-learn. Thus a measure of OTL appears to be tapping the elusive "school quality" or contribution. That there was a correlation between the ERO scores and several of the indices is evidence of convergent construct validity.

Conversely the indices were not consistently positively correlated with school decile, representing socio-economic status. (External examination results in New Zealand are positively correlated to the socio-economic rating of the school (Harker & Nash, 1996)). In this empirical study, however, there is

no consistent relationship between index scores and the socio-economic background of the schools. This indicates that the index is not reflecting socio-economic advantage, but rather it is capturing aspects of the contribution of the schools. It should be noted that two of the schools from very disadvantaged areas were part of a government-funded, principal-led programme to improve such schools. One in particular scored very highly (it also received a very glowing ERO report), and both were above average in most indices.

The nine indices could be regarded as nine measures. The correlations between them behaved in a manner that seemed intuitive. Aspects that are conceptually similar, Work Skills and Self-management Skills were highly correlated, while there was lower correlation between two disparate indices, Physical Skills and Numeracy Skills.

Contribution

The instrument provided worthwhile information about the unique contributions of the different schools. The effect due to gender is relevant to current research and concern in education. The negative correlation with decile for several of the indices also raises interesting questions. This work has already contributed to the research arena by showing that it is worthwhile to ask students about their educational opportunities, and suggesting the construct of "received curriculum" as an intermediate step between "implemented curriculum" and "learned curriculum." The wider nature of the contribution of schools is addressed in this research, with emphasis on often ignored aspects such as social skills and physical skills.

The resulting survey instrument has potential for use in school evaluation. As a process indicator, it can provide feedback in time to make improvements, unlike academic results which are generally available after the year has ended. The Schooling Strategy 2005-2010 (Ministry of Education, 2005a) sets out the proposed strategy for education in New Zealand. One of the three main emphases is on evidence-based practice, where schools and researchers find out what is working and what isn't. An instrument like the ESA test could be useful to schools at various levels of interest as a diagnostic tool, particularly with baseline data for comparison, and to explore the effectiveness of various practices and initiatives. The mean scores for the various indices can give principals timely information on areas of relative strength and weakness in their school.

A major concern with indicator systems is that they can distort the system they attempt to measure. A common example of this is "teaching to the test" in order to get good results for the school, while ignoring wider aspects of education. Another is working at the margins, as discussed by Mayston, (2003), where the most effort is put into getting borderline students to pass tests, and capable students

are ignored. The major strength of the approach developed here is that it may be less subject to perverse incentives than many indicators. Teaching to the test in this case is less likely to lead to counter-productive results. A teacher or school attempting to improve the scores in this instrument is probably improving the standard of education.

Future use

The viability of an instrument to measure opportunity-to-learn from the students' perspective opens up many possibilities for further research. These include further exploring the effect on a student's opportunity-to-learn of student characteristics, such as socio-economic background, age, ethnicity, family make-up and gender, teacher characteristics, such as gender, experience and qualifications, class characteristics such as gender and age make-up and size as well as school characteristics, including decile, and whether it is single-sex or co-educational, state, private or integrated.

It would also be worthwhile to study the relationship between the teachers', parents' and students' perceptions of opportunity-to-learn. This is particularly relevant with respect to the Schooling Strategy (Ministry of Education, 2005a) which emphasises the role of families and whanau in children's learning.

The ESA test was developed to be appropriate to a wider range of ages than just the first three years of high school and its use could potentially be extended to years 6 to 13. This then opens up other elements of interest such as the effect of school type (Contributing, Intermediate, Full-primary, Composite or Junior College) on educational opportunity.

The different average index scores for boys and girls may help to identify why boys are generally not performing as well as girls in many instances. The extent of gender difference in perceived opportunity differed between schools. In several schools there was no significant gender difference. A closer investigation of these schools might identify practices which improve opportunity-to-learn for all students.

Opportunity-to-learn can be regarded as a process variable that influences academic and other outcomes of schooling. There is potential for further work exploring the relationship between measured perception of opportunity-to-learn (the indices developed here) and academic and other results, particularly in a longitudinal study. This would explore the relationship between opportunity-to-learn at school and resultant learning and life outcomes.

Issues of educational opportunity and equity are important in New Zealand, particularly with regard to Maori, the indigenous people. This instrument could be used to measure and compare opportunity for different minority groups and to evaluate programmes that aim to improve access.

Limitations and Further Development

The results have shown that the concept of having an instrument to measure opportunity-to-learn by asking the students has value. The sample taken was adequate for illustrating the potential of such an instrument. The process has revealed some limitations of the instrument itself and of the concept, some of which could be addressed by further refinement.

The use of nine separate indices is rather unwieldy and may lead to spurious results. A further development of the instrument would include reducing the number of indices, particularly in areas where there is clear overlap such as Work and Study Skills and Self-Management Skills. With fewer indices, more items for each index could be included without increasing the load on the students. The items that were rejected at the index development phase could be improved or replaced.

For a study such as this, the sample size of 1300 students was sufficient to provide worthwhile baseline data. However, if a much larger sample were taken, over more schools, some of the effects that were ambiguous in these results could be better analysed. A more valid baseline could be established with which individual schools could compare themselves. This would require substantial funding, probably from the Ministry of Education.

The method used for developing the indices provides only relative results. The index scores are given in terms of standard deviations above or below the mean for the sample as a whole. Comparing values between the indices implies that the twenty schools as a whole group are performing equally well on the nine indices. Thus a global weakness in a certain area, such as Information Skills would not be identified. The index values are not easily interpreted for the layperson. There is a concern that they could become misunderstood in the way that decile ratings have.

This instrument is based on student perceptions. Pacific Island students scored higher than other students in most of the indices. This effect may be cultural, due to a desire to please, or a general liking for school, or it may be that the three schools in the sample with Pacific Island students are providing excellent opportunities for them. Further qualitative study coupled with a more focussed sample could help illuminate what underlies this effect.

The instrument showed its usefulness at an aggregated level. It has yet to be shown whether it can provide useful information regarding individual students and their perceived opportunity-to-learn. This will be examined to a limited extent in the final phase of the research.

Comment

The instrument included a question: “Is there anything about you that makes it difficult for you to learn at school?” followed by a request for explanation. About 8% of the students (103) wrote explanations. There was a wide range of response, much of which was not really about them, but rather about the environment. Twelve students reported that they had poor vision, some of which was not being corrected. Three students said they had hearing problems. Noise and “people distracting them” figured highly, with nine commenting on being distracted, and six saying that noise was a problem. Twelve students wrote explanations related to their learning ability, saying that they had dyslexia, short attention span or similar. Teachers figured in ten of the comments, such as “I don't get along with the teachers” and “Teachers make it boring”. Teasing was mentioned by four students. Other comments included “Because at school people call me crooked legs”, “All I want to do is skate and they don't have any thing to do with skateboarding”, “Harassed by headmaster about my hair” and “bad home life”. Their answers, even to this one open-ended question, gave a rich insight into the world of the student. This further emphasises the value of the usually untapped source of information, the students themselves.

This source of information was used in the next phase of the study, when the instrument was used to measure the opportunity-to-learn for learners with vision impairment. This further tested the usefulness of the instrument in informing decision-making.

Part C

Application area: Learners with Vision Impairment

Chapter 6:

The process for evaluating the education of learners with vision impairment

6.1 Introduction and Research questions

Introduction

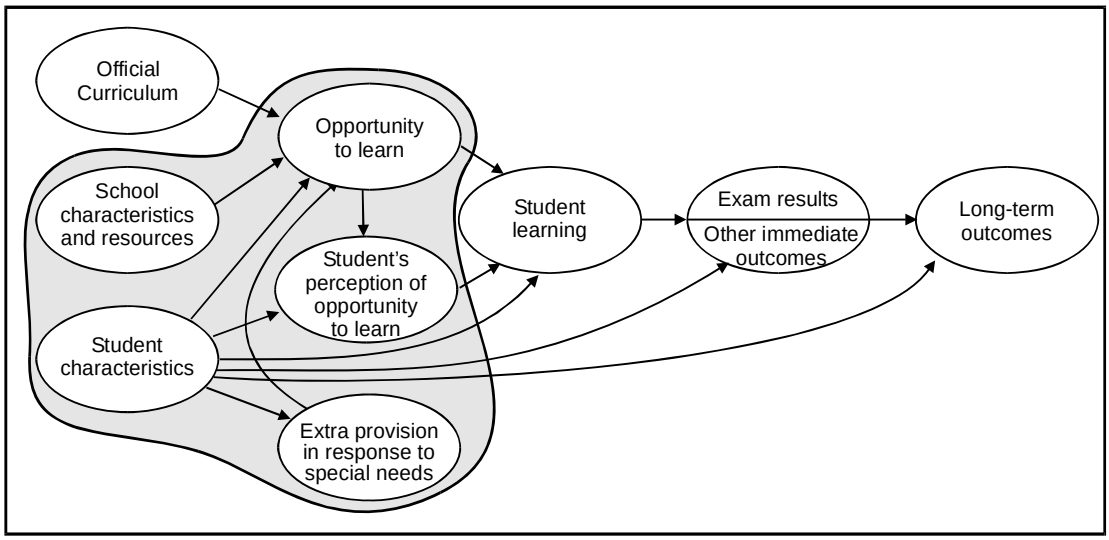
The initial motivation for the research as a whole was to evaluate the effectiveness of education for learners with vision impairment, with special attention paid to caseload allocations for RTVs. The preliminary research reported in Chapter 2 explored the purpose of the extra provision for learners with vision impairment, and suggested potential measures of need and provision. This work gave rise to the concept of Opportunity-to-learn as an outcome measure. The second phase, described in Part B – Chapters 3 to 5, built on this idea of opportunity-to-learn and developed the Essential Skills Access test (ESA), an instrument that measures Opportunity-to-learn from the students' perspective. The third phase, described in this and the subsequent chapter, involved the collection and analysis of data on individual learners with vision impairment, using the measures suggested and developed in the earlier phases. The purpose of this phase of the research was to provide information to assist decision-making in the education of learners with vision impairment. This was also an opportunity to explore the usefulness of the ESA test for such evaluations.

This chapter explains the conceptual framework and the details of the data collected, based on the findings of the preliminary study. Chapter 7 presents the results and relates them to the findings of the preliminary study and the literature. It concludes with a discussion of the process and the results.

Modelling Framework

Development of the outcome measure, the ESA test, involved a conceptual model of the relationships between inputs and outputs of education, and in particular the education of learners with special needs. This is shown in Figure 8.

Figure 8. Conceptual framework of education of learners with special needs. The shaded area shows the area of focus for this phase of the study.



The shaded region in Figure 8 represents the area addressed by the empirical research reported here. This can be classified into three areas: student characteristics, aspects of opportunity-to-learn, and provision, shown in Figure 9. Note that "Opportunity-to-learn" includes students' perception of opportunity-to-learn, and "Provision" comprises some aspects of school characteristics and resources as well as the extra provision in response to special needs.

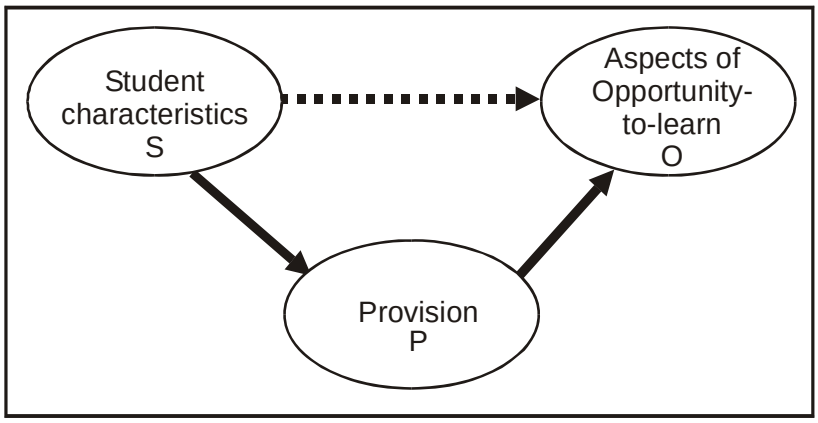


Figure 9. Framework for the empirical study

It could be postulated that ideally the opportunity-to-learn should be constant, regardless of the student characteristics – that is, all students should have equal opportunity-to-learn, or as near as possible to it. This assumes that it is possible for all students to have the same opportunity-to-learn all parts of the curriculum. In a few elements of the curriculum, for learners with vision impairment, this may not be the case, such as the opportunity-to-learn to identify colours. In general though there should be little difference between individuals' opportunity-to-learn. The provision, regular and special, should be directly related to the student characteristics, so that each student receives the provision that enables him or her to have opportunity-to-learn equal to their peers. If this were the case, then the level of provision would ensure that there was little or no relationship between the students' characteristics and their opportunity-to-learn. In other words, the provision would have balanced out any disadvantages a student has, and facilitated equal opportunity-to-learn for all.

This can be expressed in terms of a model as follows:

Let

S_i = vector of student characteristics for student i, including individual and family attributes.

P_i = vector of provision for learner i, both mainstream (provided by the school) and specialised (provided by the Resource teachers, teacher aides and ORRS teachers).

O_i = vector of opportunity-to-learn for learner i.

ε_i = the error term or random variation

We could define the relationship as

$$\mathsf{O}_i = \beta_0 + \beta_1 \mathsf{S}_i + \beta_2 \mathsf{P}_i + \varepsilon_i \quad (7)$$

expressing that the opportunity-to-learn is a function of the student characteristics and the educational provision that student receives. If the independent variables are standardised to a mean of zero, β_0 is the mean opportunity to learn, β_1 is the factor by which the student characteristics are transformed, reflecting how they affect the opportunity-to-learn, and β_2 is the factor by which the provision is transformed to affect opportunity-to-learn.

However, as the provision is responsive to the student characteristics, we can express P_i (the provision vector) as a function of S_i (the vector of student characteristics):

$$\mathsf{P}_i = \alpha_0 + \alpha_1 \mathsf{S}_i + \varsigma \quad (8)$$

where α_0 is the mean amount of provision and α_1 can be interpreted as the amount of provision added for each "unit" of disability. Greater level of disability, expressed in S_i (student characteristics) implies a higher value of P_i (provision).

Combining the two equations we get

$$\begin{aligned} \mathsf{O}_i &= \beta_0 + \beta_1 \mathsf{S}_i + \beta_2(\alpha_0 + \alpha_1 \mathsf{S}_i + \varsigma) + \varepsilon_i \\ &= \beta_0 + \beta_1 \mathsf{S}_i + \beta_2\alpha_0 + \beta_2\alpha_1 \mathsf{S}_i + \beta_2\varsigma + \varepsilon_i \\ &= (\beta_0 + \beta_2\alpha_0) + (\beta_1 + \beta_2\alpha_1)\mathsf{S}_i + (\beta_2\varsigma + \varepsilon_i) \end{aligned} \quad (9)$$

This suggests that the vector of opportunity-to-learn for learner i, is made up of a constant term, a coefficient of the vector of personal characteristics (S_i) and an error term. The constant term, $\beta_0 + \beta_2\alpha_0$ can be interpreted as the mean opportunity-to-learn for students with special needs. This is made up of the mean opportunity-to-learn for all students plus the amount of effect in terms of opportunity-to-learn that you get from the mean amount of extra provision. The coefficient of S_i is $\beta_1 + \beta_2\alpha_1$, implying that the opportunity-to-learn, O_i, is affected by β_1, the amount that opportunity-to-learn is affected by the characteristics and $\beta_2\alpha_1$, which is a combination of the effect of the characteristics and the effect of the provision.

As expressed earlier, what could be perceived as an ideal state is achieved when the opportunity-to-learn is constant. All students have the same opportunity-to-learn, regardless of their individual

characteristics. For this to be the case, the coefficient of S_i would be zero. This will occur when $\beta_1 + \beta_2\alpha_1$ is zero, which implies that $\beta_1 = -\beta_2\alpha_1$. The effect which the student characteristics have on opportunity to learn is equal and opposite to the effect of the provision. The provision balances out the characteristics that lead to reduced opportunity-to-learn.

Defining the vectors and specifically identifying the coefficients is outside the scope of this research, bearing in mind the level of variation present and the small population. However the theoretical model proposed is useful for thinking about the approximation being explored. This analysis aims to investigate the nature of S_i, the student characteristics, P_i, the provision, and O_i, the opportunity-to-learn, and explore the relationships between them.

An additional complication is that there are interactions within the categories of data. A vector S_i can include aspects that potentially increase and decrease the level of need and which interact with each other. Combinations of elements of the provision, P, will have differing effects, which are not simply additive in nature. For example the effect of the number of hours of teacher aide is available may be affected by the level of RTV provision. The effect of the whole may be more or less than the sum of the individual effects.

This discussion can be summarised by saying that, given S_i (student characteristics), the aim is to determine what P_i (provision) is needed in order to get the desired O_i (opportunity-to-learn). As the aim is to make good use of resources (or in Operational Research terms, optimise) then it is desirable to resolve what is the best way of providing P_i, in order to get the most O_i. Or, given limited resources, determine how they should best be used in order to provide the highest amount of opportunity-to-learn, with given student characteristics.

Research Questions

The research questions can be grouped into five categories. The first four categories deal with the specifics of the learners with vision impairment and the fifth category relates to the research as a whole.

1. Student characteristics (S_i)

    a. What are the characteristics of the learners with vision impairment?

2. Extra provision in response to special needs (P_i)

a. How does educational provision for learners with vision impairment compare with that for the regular population?

b. What extra provision is needed by learners with vision impairment?

c. What extra provision is provided for learners with vision impairment?

3. Opportunity to learn (O_i)

a. What are the students' perceptions of their Opportunity-to-learn, compared with those of the regular population?

b. How do the students' perceptions compare with those of their parents and resource teachers?

c. Is the range of subjects available for learners with vision impairment the same as for the regular population?

4. Relationships between characteristics, provision and opportunity-to-learn.
($O_i = \beta_0 + \beta_1 S_i + \beta_2 P_i + \varepsilon_i$)

a. What is the relationship between the student characteristics and the resource provision?

b. What is the relationship between the resource provision and the students' opportunity-to-learn?

c. What is the relationship between the student characteristics and the students' opportunity-to-learn?

d. Is it possible to identify cases and aspects of effective and ineffective practice within the provision of services to learners with vision impairment?

5. Meta-level research question.

a. Can an instrument that uses student perceptions to measure opportunity-to-learn be used for evaluating services in special education?

6.2 Data collection

Purpose

A wide range of data was sought, corresponding to the factors identified in the preliminary study, from a range of sources. The aim was to build a profile of the characteristics of the provision for these students, and to explore the relationships within the data in order to inform decision-making.

Participant Selection

The decision was made to limit the research to students in the first three years of High School, comparable with the baseline ESA test sample. An inclusion criterion was that students be listed on Visual Resource Centre rolls as having a vision impairment. Only those students who were able to understand the questionnaire sufficiently to answer the questions themselves with minimal assistance were included. It was not necessary to select a sample of the population, as the population of learners with vision impairment in New Zealand is small and could be covered in its entirety.

The Vision Education Agency (VEA), maintains a database of all but a few (about 1-2% are not included) learners with vision impairment in New Zealand, with comprehensive data on each individual, collected in 2001, and updated several times a year. As it was necessary to identify the students by name in order to administer the ESA test, consent was needed from the individual students and their parents before access to identifiable data was granted. Consent forms were developed for the students, parents, teachers, resource teachers, schools and host schools for resource centres. Separate data collection forms for each of the groups were developed. All the forms and processes were approved by the Human Ethics Committee of the University of Canterbury. Several of these are reproduced in Appendix 13.

Letters requesting consent were sent via the Vision Education Agency to all parents of learners with vision impairment in years 9 to 11 in New Zealand (N=153). It was not possible using the data in the VEA database to separate out the population of interest before requesting consent. As the initial response yielded only twenty-five consents, a further request was sent, yielding an additional thirty-seven consents. Time constraints precluded a third mailing. Parents of sixty-two young people gave consent and ten refused. Of those for whom consent was received, a further twelve were eliminated from the sample as the children had cognitive limitations to the extent that they would not have the understanding sufficient to complete the questionnaire. This led to an eligible sample of fifty individual students.

Collecting the Data

Once consent was obtained from the parents and the school, appointments were scheduled to interview the students. In parallel with this process, data was requested from the Vision Education Agency, regarding consenting individuals, and reformatted and sent with additional questions to the respective RTVs for confirmation. In addition, the Mathematics, Science and English teachers for each of the students were given or sent short questionnaires with reply paid envelopes.

The Vision Education Agency supplied full identifiable data on the consenting sample, and a smaller set of data on many non-identifying variables for the population of interest (N=153). The additional data was used to assess how well the eligible sample represented the population whose data was in the VEA database in aspects including gender, ethnic background, year level and SE2000 category. It also meant that provision data was available for the population of interest, as well as for the sample.

Nature of the Data collected

Data was requested from parents, students, teachers, schools and RTVs. Table 18 gives an overview of the data requested from each source. The data is divided into three categories – measures of need (student characteristics - S_i), measures of provision (extra provision in response to special needs as well as regular provision - P_i) and measures of opportunity-to-learn - O_i. Copies of the forms comprise Appendix 13. All of the data listed as provided by the VEA was available anonymously for the population, and identifiably for the students who had given consent.

Table 18. Data collected regarding learners with vision impairment

Source of data	Measures of Need or individual characteristics potentially affecting provision	Measures of Provision	Measures of Opportunity-to- learn
Parents	Family involvement.	Principal's attitude.	Subjects taken, satisfaction with education, school, principal.
Student	How long at the school, family involvement, computer available at home.	Principal's attitude	Satisfaction with assistance from teacher aide. RTV, O and M instructor. ESA test.
Mainstream teacher (English, Maths, Science)		Class size, teaching experience, experience and training for special needs.	

Source of data	Measures of Need or individual characteristics potentially affecting provision	Measures of Provision	Measures of Opportunity-to- learn
School	Decile of the school.	Size of school, number of ORRS students, students served by SEG.	
Vision Education Agency (confirmed by RTV)	Student's year level, sex, ethnicity, family size and place in family, language spoken at home, distance from VRC, parent attends IEP, SE2000 category, other impairments, suggested level of resource need.	Frequency of IEP, RTV hours, Teacher aide hours, ORRS teacher hours, RTV identity, VRC.	
RTV	RTV assessment of: learner's ability, learner's attitude, self-advocacy, social skills with adults, social skills with peers, family involvement.	RTV training and experience, teacher aide competency, principal's attitude.	

Some of the measures were exact and objective, such as the sex of the student, the SE2000 category, class-size and size of the school. However most of the measures had some degree of subjectivity. The nature of the various measures is discussed now.

Data from the parents

Parents were asked the name, school and year level of their child and the subjects taken in term 4 of that year (2003). The purpose of asking about the subjects was to get an indication of whether the students were limited in their choice of subjects. The subjects taken also give an indication of whether the child was in a mainstream programme, or in a special unit. This was useful for determining whether the student formed part of the target population.

Parents were asked how happy they were with the education their child was receiving, and how happy they were with the attitude of the school to their son/daughter. ("Very happy", "Happy", "Not happy" or "Very unhappy"). The parents were asked to describe the attitude of the principal of the school to learners with special needs, as supportive, neutral or not supportive. This question was included because the attitude of the principal of the school was identified in the preliminary research as having a possible influence on the quality of education received.

Parents were asked to rate their involvement as a family in their child's education, as one of "Very involved", "Involved" or "Not very involved". The preliminary study indicated that the level of family involvement affected the education of learners with vision impairment.

Data from the students

I administered the ESA questionnaire in person to most of the young people. This involved visiting schools and some homes in various parts of New Zealand, including Christchurch, Ashburton, Auckland, Northland, Gisborne, Nelson and Wellington. It was important for responses to reflect the student's own opinion, and not be influenced by a teacher, teacher aide or parent. Learners with vision impairment often need help in completing such a form, and the help would probably come from a teacher aide. As this could influence the answers it was thought preferable to use an interviewer unknown to the students.

Thirty-nine of the questionnaires were administered personally, five were completed by the students at home and one was administered at school. Five questionnaires were not completed, of which three were sent to homes as they were too remote to visit, one was sent to a school, and the other was for a student who did not complete it due to illness.

The ESA questionnaire was provided in a range of formats: N11, N14, N18 and N24 (font sizes) and in Braille. In addition I offered to read aloud the questions and write the answers. Twenty five of the students chose to have the questions read to them. After a brief chat about the study and an explanation about confidentiality, the students either completed the questionnaire independently, or responded verbally or in writing as the questions were read to them.

To begin with, the student was asked how long they had been at the school. The other introductory questions asked about the level of assistance the student received from teacher aide, RTV and Orientation and Mobility instructor. They could choose from "Not enough", "About right" and "Too much". The purpose of these questions was to get a rough idea of the adequacy of provision, from the student's viewpoint. Students were also asked two of the same questions their parents had been asked, about the principal's attitude to learners with special needs, and their family's involvement in their education. This was used to compare their perceptions with those of their parents. There was an open ended question asking what would help them learn better at school.

The remainder of the questions for the students were identical to those asked in the ESA test, described in Section 3, and listed in Appendix 7. The aim was to measure the opportunity-to-learn from the perspective of the student in a manner that was comparable with the regular population. As

with the baseline study, the final ten questions confirmed details including the year, age and home language, and asked if they had a computer at home that they were allowed to use.

Data from the mainstream teachers

Envelopes addressed to "the English teacher of (student's name)", "the Mathematics teacher of (student's name)", and "the Science teacher of (student's name)" were generally given or sent to the office of the school that the student attended. In some cases the student themselves gave them to their teachers. Each envelope contained an anonymous questionnaire, including information regarding the study and use of the data, and a reply paid envelope. Completion of the questionnaire was taken as consent for the data to be used. The form is reproduced in Appendix 13.

The teachers were asked the name of the young person with vision impairment that they taught in that class, the subject, class size, how many teachers, how many students with vision impairment in the class and how many students with special needs in the class. The teachers were also asked how long they had been teaching, and how much experience they had in teaching children with special needs, and in teaching children with vision impairment. There was a question on what training they had received for teaching learners with special needs, and if the training was helpful, followed by a space for any other comments. The aim of these questions was to ascertain whether class size, teacher experience and teacher training had any effect on the level of opportunity-to-learn for these young people.

Data from the schools

Forty schools were included in the final analysis. The motivation for the data collected from the schools was to measure the quality of the placement, reflecting the attitude to learners with special needs, and the number of learners with special needs at the school. Data was requested on the number of ORRS funded students on the school roll who were verified as having "Very High Needs", and the number with "High Needs". Information was also requested on how many students received assistance from the Special Education Grant. This was, in part, an attempt to identify if the school was a "magnet school", where children with special needs were especially well catered for and thus attracted a higher percentage of children with special needs. School size has the potential to affect the quality of education a child receives, so this was requested. The decile rating was confirmed.

Data from the Vision Education Agency

The data received from the Vision Education Agency had originally been collected by RTVs in conjunction with the children's families. It contained information about the individual students, their family and ethnic background. There was no information about their socio-economic status.

The database included information on the individual's visual status and other disabilities if any. There was considerable information regarding the provision of service, including the frequency of IEP, whether or not parents attended the most recent IEP meeting, and the distance and travelling time between the Resource Centre and the school. The RTV had estimated the number of hours of service per term they gave the student, divided into five categories: direct teaching, assessment, consultation, programme preparation and report writing, and preparation of special format and resource materials. They had also estimated the current recommended level of service in each of these areas, which could be quite different from the current provision.

There was also an assessment of weekly school-based support for the student. This included estimates of weekly hours for ORRS teacher, teacher aide, special needs co-ordinator, material production and other. Data on provision was important for exploring the relationships between characteristics, provision and opportunity-to-learn, and to get some indication of the cost of provision. To ensure that this information was current, it was reformatted and sent to the RTVs for confirmation and correction. This resulted in some changes to the data, mainly with respect to the provision data.

Data from the Resource Teachers: Vision (RTVs)

In addition to confirming and correcting the VEA data, the resource teachers were asked about themselves and the students in the sample with whom they worked. They were asked how many years they had worked as an RTV and what training they had received. It seems reasonable to suppose that the effectiveness of the RTV may be affected by experience and training. Regarding the student, the RTVs were asked for their assessment of the student's general ability, attitude to learning, self advocacy skills, social skills with adults and social skills with their peers. These qualities and skills had been identified in the preliminary research as potentially affecting the amount and type of extra resourcing students need. As with the parents and the students, the RTVs were asked about the principal's attitude and the family's involvement. This was to compare with that of the family. Finally the RTVs were asked to assess the competence of the teacher aide in their role, and braille proficiency if this was relevant. Results of preliminary research had suggested that the competence of the teacher aide could potentially affect the quality of the child's education.

Outcome Measures

The potential outcome measures identified in the preliminary study included a measure of satisfaction by the child, parent and/or mainstream teacher. In this data collection the parents were asked about their level of satisfaction directly, and the students were asked about their satisfaction with their assistance. The main measure was the ESA test, a measure of access to the skills of the New Zealand curriculum, as suggested in the preliminary study. Other suggestions from the preliminary study were a measure of happiness or self esteem, choice of curriculum areas, access to recreation, and daily living skills. The measure of happiness was not made directly, but collected incidentally with the ESA test, along with indications about access to recreation and daily living skills. Students were asked about choice of curriculum areas. Not implemented were the ideas of a measure of achievement of IEP goals, an indicator of progress, academic achievement, or achievement in the expanded core curriculum.

Data Preparation

The data was entered into Excel spreadsheets and converted to SPSS. The ESA test questions were converted to index scores using the same transformation as for the baseline sample so that the scores were comparable to the baseline sample. Descriptive analysis and graphs were used to identify possible errors in the data. A summary of the univariate measures was compiled and sent to the parents and participants. Separate files were created for the data on the resource teachers, the mainstream teachers, the schools and the VEA population.

Chapter 7:
Results of analysis of the education of learners with vision impairment

Within the VEA database there was data on the 153 students with vision impairment in Years 9 to 11. As the VEA database contains data on all but 1-2% of the population of learners with vision impairment who receive services from the RTVs, this is considered the population of interest. Some non-identifying information was available without individual consent, but it was not sufficient to determine whether the students met the inclusion criteria. Of the sixty-two students from whom consent to take part in the study was obtained, fifty students met the inclusion criteria. Of the fifty who met the inclusion criteria, five did not complete the ESA test. Figure 10 gives a diagrammatic representation of the relationship between the sample and the population/database. The figures for the eligible population are approximated using information on the students' additional special needs.

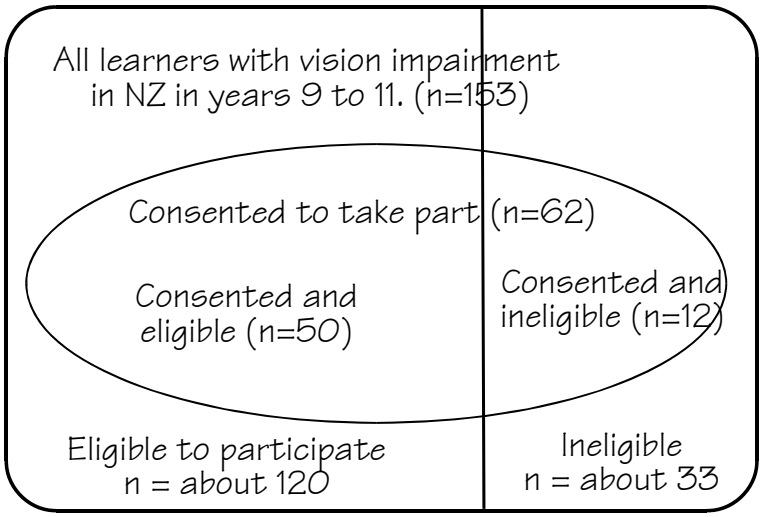


Figure 10. Population and sample details

7.1 Student and background characteristics – the nature of the population and the sample

As some data is available on the total population (or close to it), it is possible to ascertain how closely the eligible sample is representative of the population. In this section, the eligible sample is described and compared with the population data from the Vision Education Agency (N= 153). For some variables the sample data is also compared with data from the regular (sighted) population. Unless otherwise stated, the statistics given correspond to the eligible sample (n=50).

SE2000 funding categories

The broad SE2000 categories are assigned by the Ministry of Education and used to determine the level of funding provided for each student. They are indicative of the student's level of need. (This is explained in Section 1.2). All totally blind students who use braille as their main mode of learning are classified (verified) as having Very High Needs(III). There are also a few students in this category who use both braille and print, or who have severely low vision. (Also classified as having Very High Needs(III) are those with vision impairment and multiple special needs; students from this group were excluded from the sample.)

Table 19 summarises the numbers of students in each of the SE2000 categories, comparing those in the VEA population data, those who gave consent, and those in the eligible sample. This gives an indication of the number of students in the VEA database who would not be part of the population of interest. It is assumed that all of the 25 students with multiple special needs ((α) in the table), the

unclassified students (β) and some of the High Needs(II) students with additional needs (γ) would not be eligible. This returns an approximate figure of 120 students eligible to be in the sample, of whom fifty gave consent.

Table 19. Number of students in the sample, compared with the VEA database, broken down into levels of need.

SE2000 Category	Description of students	Total VEA database	Gave consent	In sample
Very High Needs (III)	blind academic	10	6	6
	severely low vision	4	1	1
	multiple special needs (ineligible to participate in this research)	25 (α)	8	0
	unclassified	4 (β)	0	0
High Needs (II)	no additional needs identified	46	18	18 (3 did not complete ESA test)
	with additional needs	22 (γ)	17	13 (2 did not complete ESA test)
Moderate Needs (I)		42	12	12
Total		153	62	50

Thirteen of the students in the eligible sample were identified as having additional special needs which did not exclude them from the study. These additional special needs included hearing impairment, cerebral palsy, Aspergers Syndrome, developmental delay, epilepsy and health problems. In summary, the eligible sample is made up of seven students in the Very High Needs (III) category, thirty-one students in the High Needs (II) category and twelve students in the Moderate Needs (I) category.

Gender, Year Level and Ethnicity

It is common in the area of special needs for there to be a predominance of boys. This was not the case among the learners with vision impairment. There were eighty-four boys (55%) and sixty-nine (45%) girls in the VEA database. The difference between proportions in the sample and in the population was not statistically significant. The boys were not more or less likely to give consent than girls.

In the VEA database there is a fairly even spread over the three year levels, 9,10 and 11. The figures for this are given in Table 20, showing the breakdown of the sample by year level. There is no

significant difference between the proportions in the sample and in the population. The sample is representative of the population with regard to year level.

Table 20. Year level figures for the population and sample.

	VEA population	Consented	Sample	Completed ESA test
Year 9	48	24	20	19
Year 10	46	18	13	11
Year 11	59	20	17	15
Total	153	62	50	45

It is possible that the ethnic background of the learners with vision impairment would affect their opportunity-to-learn, especially as the RTVs are almost exclusively of NZ Pakeha or European ethnicity. The ethnic profile of the students in the VEA database reflects that of the general NZ population of people of that age group (See Table 21). Of the twelve Pacific Island students in the VEA database only two gave consent (One of the forms arrived after the data collection had been completed, leaving just one in the sample). Table 21 gives the percentages for the populations and samples.

Within the sample two students spoke a language other than English at home – one Middle Eastern and one Pacific Island language. There was a greater reduction in the number of Maori students who completed the ESA test. All three of the Maori students who did not complete the ESA test lived in remote areas and two of them were in the same family.

Table 21. Ethnic background of the NZ population, VEA database and the sample

	NZ population (under 15)	VEA database	Consented	Eligible sample	Completed ESA test
NZ Pakeha	62%	99 (65%)	45 (73%)	37 (74%)	35 (78%)
NZ Maori	25%	34 (22%)	13 (21%)	9 (18%)	6 (13%)
Pacific Island	8%	12 (8%)	1 (2%)	1 (2%)	1 (2%)
Other	5%	8 (5%)	3 (5%)	3 (6%)	3 (7%)
Total		153	62	50	45

Family Circumstances – Size, Place, Computer

Family size in the sample ranged from one child to six children. The average family size for the sample was 2.9 children. This is higher than the national average of 1.9 children per family. However this could be explained in that the national average includes families that have not reached their final size, whereas taking a sample of teenage children means that the family is likely to be at its maximum. Two-thirds of the children were from families of two or three. There were three "only children". Sixteen were the eldest and thirteen were the youngest in their family. It was thought that most of the children would be youngest or only children, but this was not borne out by the data.

The ESA test included a question about whether the student had access to a computer at home. Thirty-nine of the students with vision impairment (89% of the 45 who answered the ESA test) had a computer available at home and five did not have a computer available. (One did not respond.) This is slightly higher than the 82% with a computer available in the baseline sample of students with no identified special needs.

Family Involvement and Parents' Attendance at IEP Meetings

Family involvement, thought to be an important factor, was assessed by the child, the parent and by the RTV. In a third of the cases the parent, child and RTV gave the same assessment of the family's involvement: ten families were unanimously assessed as very involved, five as involved and two as not very involved. The Friedman test, used to compare two or more related samples, gave a p-value of 0.195, indicating an acceptable level of agreement.

Figure 11 is a graphical representation of the three viewpoints on family involvement. Uniform colour across a line indicates agreement among the three parties. The numbers are the response frequency. For example, of the twenty-six families rated by the child as "Very Involved", fifteen were rated by the parents as very involved, nine as involved and two as not very involved. The rating of family involvement was not related to the year level of the student.

Child	Parent	RTV
Very Involved 26	Very involved 15	Very involved 10
		Involved 5
	Involved 9	Very involved 2
		Involved 5
		Not very 2
	Not very 2	Very involved 1
		Involved 1
Involved 14	Very involved 7	Very involved 3
		Involved 2
		Not very 2
	Involved 7	Very involved 2
		Involved 5
	Not very 1	Very involved 1
Not very 2	Not very 2	Not very 2

Figure 11. Ratings of family involvement by Child, Parent and RTV (Response and frequency of response)

Another indication of a family's involvement in the student's education is the parents' attendance at IEP meetings. Out of the thirty-eight students (Very High Needs(III) or High Needs(II)) for whom Individual Education Plan (IEP) meetings were held, thirty-three mothers and fifteen fathers had attended the most recent meeting. Three IEP meetings were undertaken with neither parent present, and for thirteen meetings, two parents were present. This is a considerably higher level of attendance than was estimated in the preliminary study, when RTVs suggested that up to half of the IEP meetings were not attended by parents.

Student Characteristics as Assessed by RTVs

Individual ability, attitude, advocacy and social skills were suggested in the preliminary study as personal characteristics that might affect the level of need for extra provision. The RTVs were asked for broad assessments of these characteristics. Figure 12 illustrates the results.

The students scored lowest in self-advocacy skills, which are especially important for students with special needs in order to explain their needs and preferences to teachers and service providers. Two-thirds of the students were rated as having adequate or good advocacy skills. The students are fairly evenly spread with respect to ability. The students rated better at relating to adults than to their peers. The attitude of the students was rated highly by the RTVs. Only 17% had low motivation, and 40% were highly motivated.

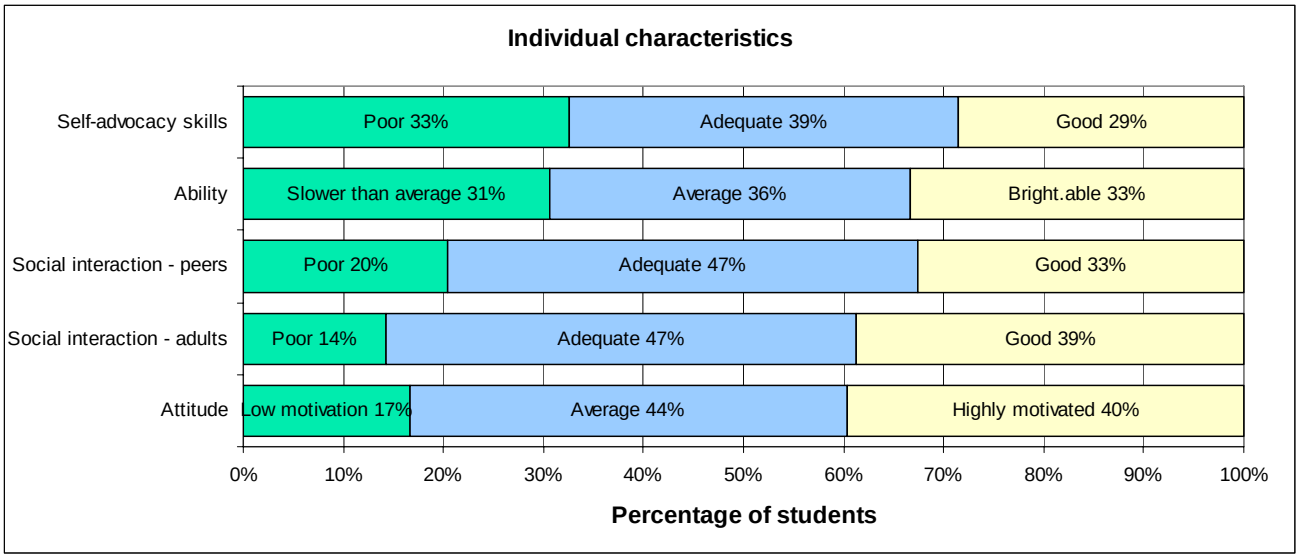


Figure 12. Personal characteristics of students as assessed by the RTVs.

The assessments of the personal characteristics of the students were all positively correlated with each other. The Spearman correlations between the assessments are given in Table 22.

Table 22. Correlations between student characteristics as assessed by the RTVs

Correlations

			ability (RTV assess)	attitude (RTV assess)	advocacy skills (RTV assess)	social skills with adults (RTV assess)	social skills with peers (RTV assess)
Spearman's rho	ability (RTV assess)	Correlation Coefficient	1.000	.597**	.450**	.420*	.598**
		Sig. (2-tailed)	.	.000	.010	.017	.000
		N	32	32	32	32	32
	attitude (RTV assess)	Correlation Coefficient	.597**	1.000	.629**	.585**	.456**
		Sig. (2-tailed)	.000	.	.000	.000	.002
		N	32	44	44	44	44
	advocacy skills (RTV assess)	Correlation Coefficient	.450**	.629**	1.000	.782**	.378*
		Sig. (2-tailed)	.010	.000	.	.000	.010
		N	32	44	45	45	45
	social skills with adults (RTV assess)	Correlation Coefficient	.420*	.585**	.782**	1.000	.421**
		Sig. (2-tailed)	.017	.000	.000	.	.004
		N	32	44	45	45	45
	social skills with peers (RTV assess)	Correlation Coefficient	.598**	.456**	.378*	.421**	1.000
		Sig. (2-tailed)	.000	.002	.010	.004	.
		N	32	44	45	45	45

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Transition Times

Findings of the preliminary study suggested that transition times, such as between schools, required a higher level of service. Frequent changes of school are thought to decrease educational efficacy, and would affect the level of provision a learner with vision impairment might need. All but three of the students in the sample had been at the same school since the start of high school (Year 9), or in some cases (area schools, year 7 to 13 schools) longer. Because of this lack of variation in the data, it is not possible to draw any conclusions about the impact of frequent changes in school. The use of the VEA database for obtaining consent may have meant that students who had moved recently did not receive their invitations to participate in the study, and are thus under-represented.

Decile of School

Data on the socio-economic status of the students was not available in the VEA database. The decile level of the school the student attended was examined. Table 23 and Figure 13 show the percentage of students in each decile group for the general population, the VEA population, the consenting sample and the eligible sample. There is a statistically significant difference ($p=0.01$) between the proportions in different decile groups when comparing the population of learners with vision impairment with the general NZ population. In particular there are fewer students in the high decile schools, with only five students in the VEA database (3.5%) attending decile 10 schools, whereas 16.5% of high school students in the general population attend decile 10 schools. This corresponds with the findings reported by Chalifoux & Fagan (1997) that families of students with disabilities have lower incomes on average than the general population.

Table 23. Comparison of numbers of students in different decile schools.

	NZ population (secondary school students)	VEA database	Consented	Sample
Low (1-3)	19%	27% (38)	31% (19)	34% (17)
Medium (4-7)	46%	48% (69)	50% (31)	50% (25)
High (8-10)	35%	25% (36)	19% (12)	16% (8)
Number in group		144	62	50

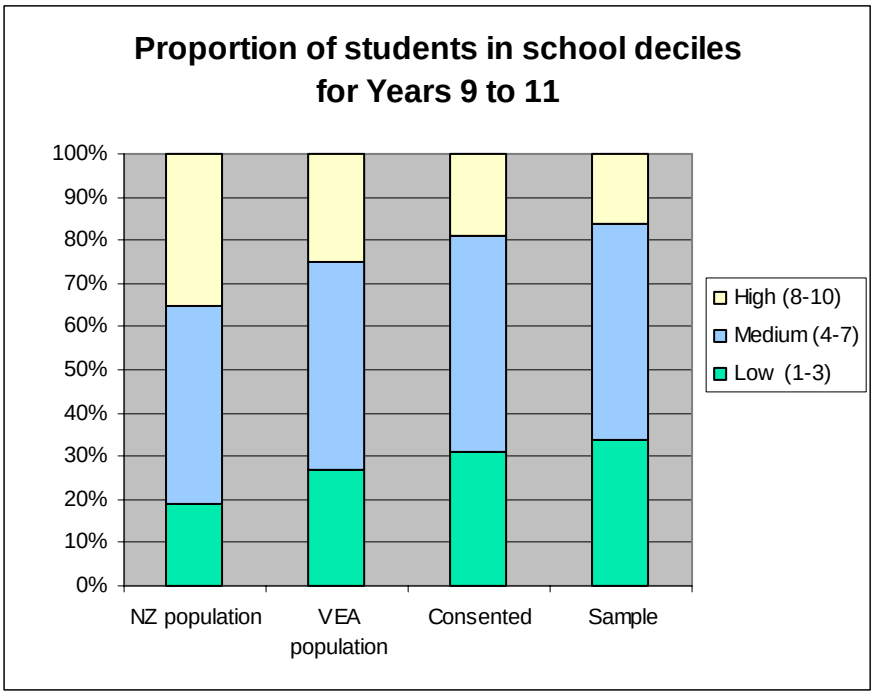


Figure 13. Proportion of students in each school decile group

The differences in proportions of students in the decile groups between the VEA database and the consenting group and the eligible sample were not statistically significant.

7.2 Educational provision

The term "provision" encompasses "regular" provision from the school, equivalent to what all students receive, and "extra" provision in response to special needs. Both the perceived need for provision and the actual provision is included in this analysis.

Principal's Attitude

In the preliminary study it was suggested that the attitude of the principal affects the way a school functions, and in particular the students' level of access to the curriculum. The students, parents and RTVs were all asked about whether the attitude of the principal of the school to learners with special needs was supportive, neutral or not supportive. The students all rated the principal as supportive or neutral. Six principals were rated as not supportive to learners with special needs, one by a parent, four by the RTV and one by both parent and RTV. For three of the five principals rated by RTVs as not supportive, both the parents and the students rated them as supportive. The Friedman test, used to compare two or more related samples, gave a p-value of 0.141, which indicates an acceptable level of agreement. The average rating for the students was 1.6, for the parents 1.8, and for the RTVs 1.5. (1 = not supportive, 2 = neutral and 3 = supportive). Thirty-two of the parents rated their principal as supportive, whereas twenty-five of the students rated their principal as supportive. In the four schools with more than one student in the study, the ratings were highly consistent among the parents and the students. The agreement in opinion regarding the supportiveness of the principal is presented graphically in Figure 14.

Student	Parent	RTV
Supportive 25	Supportive 21	Supportive 14
		Neutral 4
		Not supportive 3
	Neutral 2	Neutral 2
	Not supportive 1	Not supportive 1
Neutral 15	Supportive 11	Supportive 9
		Neutral 2
	Neutral 3	Supportive 2
		Not supportive 1
	Not supportive 1	Neutral 1

Figure 14. Ratings of principal support by Student, Parent and Resource Teacher:Vision

Mainstream Provision

School size

There was a possibility that students with vision impairment are more likely to attend smaller schools, as parents may perceive them as better able to provide for their child. This was not the case. The average roll-size of the schools for the sample was 1060, and the range of school size was from about 200 to over 2500 pupils. The distribution of school sizes compared with the regular population is shown in Figure 15. The average roll size in the total secondary school population of New Zealand, weighted by pupil, is 1137. In a t-test comparing the sample mean with the population mean, the p-value was 0.4. From this we can conclude that there is no difference in school size for learners with vision impairment than for the population as a whole.

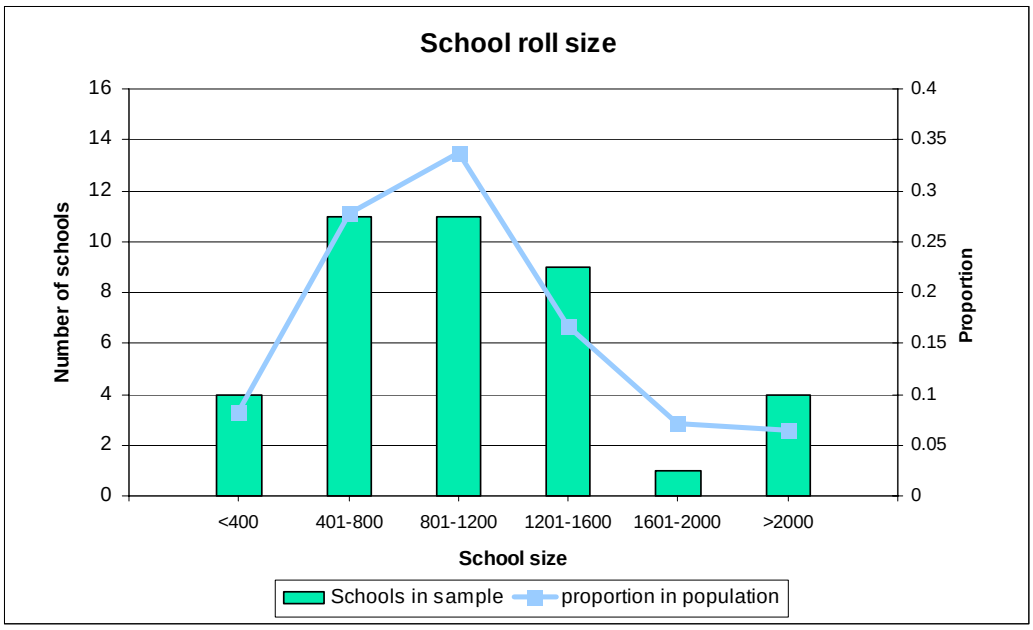


Figure 15. Comparison of school roll size between the regular population and the sample of learners with vision impairment.

Students with special needs at the school

Information was requested from the schools in the survey with regard to how many ORRS (Ongoing and Reviewable Resourcing Scheme) funded students were on the school roll, verified as having Very High Needs(III), and how many with High Needs(II). Nearly two-thirds of the schools had one or no students with Very High Needs (III). On average, just under 1% of the pupils were identified as having High Needs(II). There were five schools whose ORRS students (High and Very High Needs) made up

more than 2% of the total school roll and for one of those the figure was over 3%. Over all the schools, ORRS students made up an average of 1% of the total rolls of the schools, which is the same percentage as that for the total population. (Ministry of Education, 2004)

Information was also requested on how many students received assistance from the Special Education Grant at each of the schools. Some schools were unable to provide this information. This grant can be used to provide teacher aide assistance to a whole class, or for individual or small group help, thus making it difficult to specify the number of students involved. Six of the schools said there were no pupils in this category in the school, while a quarter of the sample gave numbers of one hundred or more. The mean figure was ninety, with a median of forty-one.

Class size

There is ongoing debate about the impact of class size on educational opportunity (Zurawsky, 2003). This factor was identified in the preliminary study as possibly affecting the need for service provision from the RTV. It was implied that a student in a smaller class was getting a higher level of teacher input and thus would possibly need less extra help from the RTV. The average class size for the core subjects of English, Mathematics and Science was 26, with the largest class being 33 and the smallest 6. Most (80%) of the classes had between 20 and 30 students. In all but ten of the 118 classes in the sample there was only one learner with vision impairment, but a third of the classes had more than one learner with special needs.

There is little data available on class sizes in New Zealand schools. The staffing entitlements are 1:25 for years 9 and 10, and 1:23 for Year 10. However these do not translate into classes of this size across all subjects. In particular the core subjects (English, Mathematics and Science tend to be larger, to balance smaller classes provided in curriculum areas of lower demand. (Hipkins & Hodgen, 2004) Some of the students with additional special needs were in very small classes for their core subjects. It appears that sometimes learners with vision impairment are placed in smaller classes, but in general they are in similarly sized classes to the general population.

Mainstream teacher experience

In the preliminary study it was indicated that the quality of the mainstream teacher made a difference to the level of access the student received. As teacher quality is currently considered one of the main precursors of quality learning, (Alton-Lee, 2003) this is not surprising. As it is problematic to measure teacher quality, the length of teacher experience is sometimes used as a proxy measure. It was surmised that it might be beneficial, or common practice to ensure that learners with vision

impairment were placed with teachers who have more experience, or that first and second year teachers might not be given the responsibility of having a student with special needs in his/her class.

Responses were received from teachers of English (n=39), Mathematics (n=41) and Science (n= 38). The average number of years of teaching experience was 19 years for English, 15 years for Maths, and 12 years for Science. Thirteen of the teachers (11%) were in their first or second year of teaching. The distribution of experience for the teachers in the eligible sample (LVI) was compared with a sample taken in a National Survey of Secondary Schools 2003 (NSSS)(Hipkins & Hodgen, 2004). Figure 16 illustrates this. There appears to be a larger proportion of less experienced teachers in the LVI study, but this did not achieve statistical significance. (Chi-squared test, p=0.09). As younger teachers were known to be slightly under-represented in the NSSS sample, compared with the population, it is likely to have overestimated the average years experience. We can conclude that the distribution of teaching experience is no different for learners with vision impairment than for the regular population. The learners with vision impairment are not being taught by more or less experienced teachers than the regular population. The category of "less than 2 years" is used as this is the time during which a teacher is gaining registration.

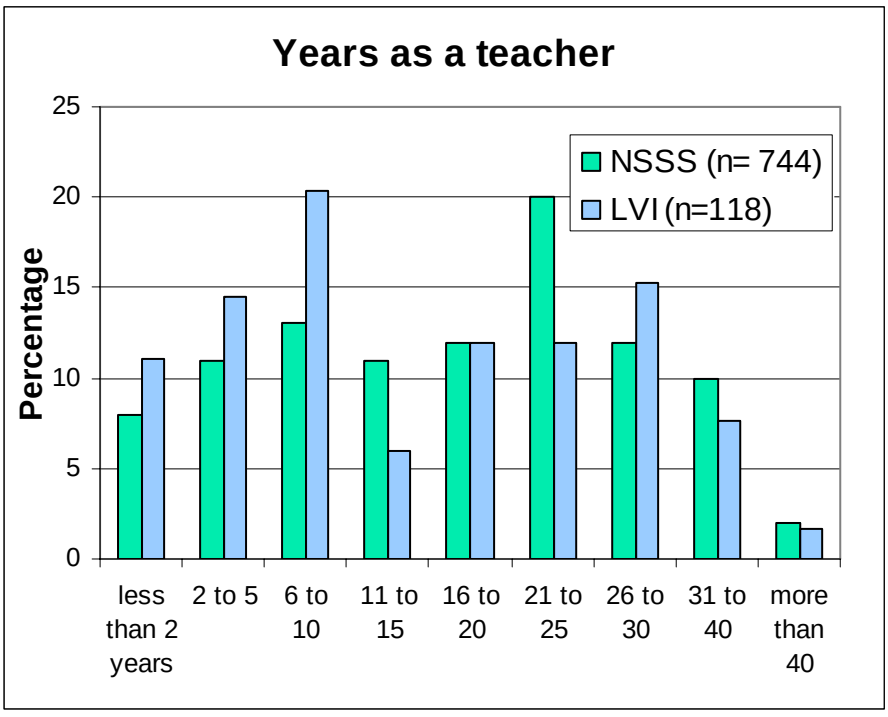


Figure 16. Comparing the level of teacher experience for learners with vision impairment with that of the general population

On average, the teachers had taught learners with special needs in about 8 classes in their career, and learners with vision impairment in about 3 classes in their career. Seventy-three percent of teachers

had had learners with vision impairment in their class two times or fewer. For just under half of the teachers, this was the first time they had taught a student with vision impairment. Figure 17 and Figure 18 show the distribution of number of "class years"[1] of experience with learners with special needs and with students with vision impairment. Not surprisingly there is a higher level of experience teaching students with special needs than teaching students with vision impairment.

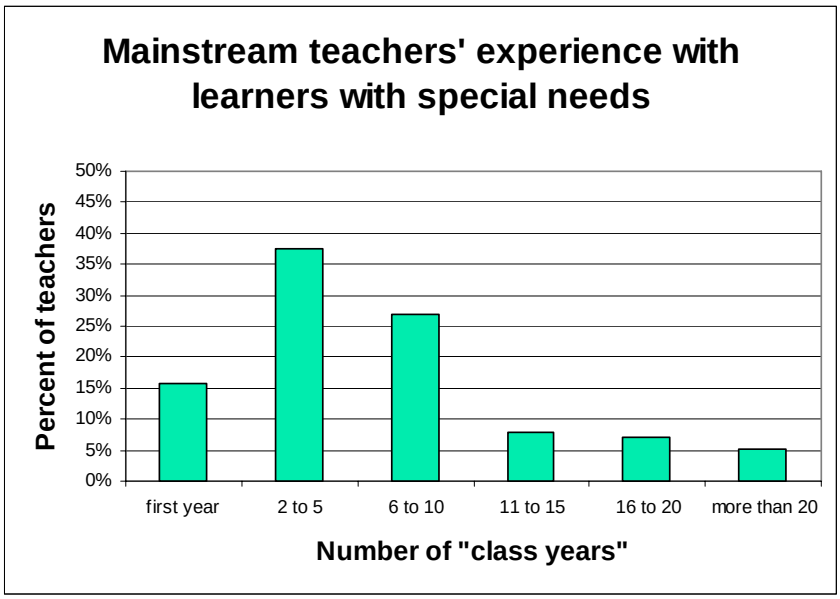


Figure 17. Mainstream teachers' experience with learners with special needs.

Seventy percent of the teachers said they had received no training for teaching learners with special needs, or very little. Nearly all those who received training said that it was helpful. Generally the teachers would have liked more information and more training, sometimes finding out useful information near the end of the year when it was felt to be too late. A teacher commented, "One of the curiosity factors for teachers these days, is that "main streaming" attracts funding for children with special needs. Support is clustered around the child with additional support staff and units – very little "extra" training is provided for the teachers, who are often expected to adapt their programmes for the special needs children." Another responded, "Teachers need support, both in the classroom and in preparation." These responses correspond with the conclusions of the 2001 Education Review Office report (Education Review Office, 2001) that "Given the complexity of the education, training,

[1] A "class year" is defined as the number of classes times the number of years. (For example if a teacher had two classes with children with special needs in them in one year, that would count as two "class years".)

management and support needs of many special needs children, the present training and support for teachers and teacher aides is inadequate."(p. 30)

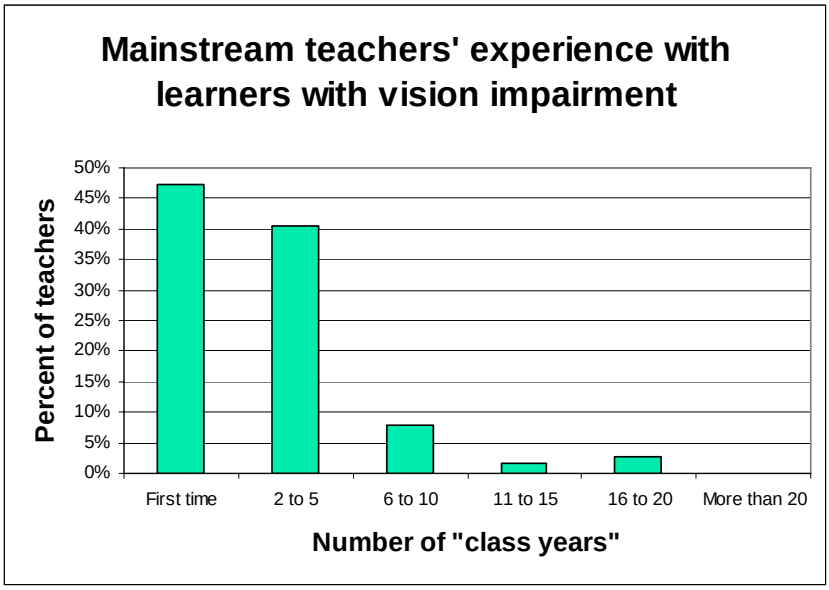


Figure 18. Mainstream teachers' experience with learners with vision impairment

Hill (1990) commented that "few studies have examined the role of the Regular Education Teacher in providing an appropriate learning environment for visually impaired students." (p. 354) A review made of recent research literature showed that this is still the case. There is often ambiguity about the relative roles of the mainstream teacher and the RTV.

Summary of mainstream provision

The schools attended by the students in the sample are similar in size and proportion of students with special needs to those in the population. One might expect students with vision impairment to attend smaller schools or schools with a higher proportion of learners with special needs, but this does not seem to be the case.

The mainstream provision for learners with vision impairment appears to be little different from that of students in the regular population. The profile is similar with respect to the school size and numbers of students with special needs. They are drawing on the same population of teachers. The class sizes may be smaller in some cases, particularly when the students have additional special needs. The teachers would like more help in teaching learners with special needs.

Specialist Provision and Teacher Aides

The number of visits by an RTV ranged from once a year, for monitoring purposes, to daily for students with a resource teacher in the same school. The median number of visits per term was two. Most (80%) of students received visits every two weeks or less frequently. Among the students in the Very High Needs (III) category the median number of visits was fifteen per term. For those in the High Needs(II) category it was 2 visits per term, and nearly all the students without ORRS funding (I) were visited once a term or less often.

The allocation of teacher aide hours was closely linked to the ORRS category. Those in the Very High Needs category (III) were allocated on average 23 hours per week of teacher aide time, those in High Needs (II) were allocated ten hours and Moderate Needs(I) students received no teacher aide help, except for one student who had access to a teacher aide provided for an ORRS funded (category II) classmate. Table 24 summarises these results.

Table 24. Service Provision by funding category (n= 50)

	Not ORRS funded (Moderate needs)(I)	**High Needs (II)**	**Very High Needs (III)**
Number of students in category	12	31	7 (6 braille students and one very low vision)
Number of visits per term by RTV (median)	1 visit	2 visits	15 visits
Teacher aide hours per week (median)	0 hours	10 hours	23 hours
Average number of hours service per term provided by RTV.	3 hours (range = 0 to 9)	9 hours (range = 1 to 45)	45 hours (range = 4 to 100)
IEP meetings	Not held	2 per year	2 per year

Twenty-five RTVs participated in the study. Among them there was a wide range of experience, from half a year to 25 years, with an average of ten years. Seventeen (68%) were trained specifically to teach learners with vision impairment, and five were undertaking the Diploma for the Education of Visually Impaired. Eleven resource centres/rooms were involved, including both the larger and smaller centres. The teachers with minimal training were generally employed to enable release time to teachers who were training part-time in 2003.

Thirty-four of the fifty students received help from one or more teacher aides. The RTVs rated 82% of the teacher aides as “very competent”, and the remaining 18% as “competent enough”. For the six students who used braille, two of the teacher aides were assessed as “proficient in braille”, two as having “adequate braille knowledge” and two as having “inadequate braille knowledge”.

Half the students in the VEA database attended schools within twenty-five minutes driving time of the Resource Centre. The mean driving time was thirty-eight minutes, and the maximum time was nearly four hours. There was no significant difference between the mean values for those in the eligible sample and those not. The number of visits a student received per term from the RTV was not related to distance from the Resource Centre.

Specialist Provision

Data was available from the Vision Education Agency with regard to specialist provision for the whole database population of 153 students. This is summarised in the next section.

The VEA database included data on the desired level of provision by the RTV for the students, as assessed by the RTV. Note that this did not include or specifically take into account teacher aide time, other specialist time or other teacher time. The RTV provision was specified in five categories: direct teaching, assessment, consultation, programme preparation and report writing, and preparation of special format and resource materials. Over half of the population was assessed by the RTVs as requiring no hours of direct teaching by RTVs. About ten percent were estimated as needing three hours a week or more. The mean value was nine hours per term or about an hour a week. The distribution of estimated need (as assessed by the RTVs) in terms of RTV time is shown in Figure 19. The mean and median values in the different categories are shown in Table 25.

This information is subjective in nature. Some RTVs are confident that they provide a satisfactory service, and this guides their assessment of the students' needs. However as Resource Centres have largely been run independently since their inception, RTVs can have quite different perceptions of their roles. In the 1990s some Resource Centres, and the VEA itself were active in trying to increase Government funding to employ more staff in order to cope with a perceived growing demand through roll growth. As a result they may have had different perceptions of the ideal level of service. Conversely the level of funding has altered RTVs' perceptions of their role, in order to fit the budget. These ideas will be discussed further in Chapter 8.

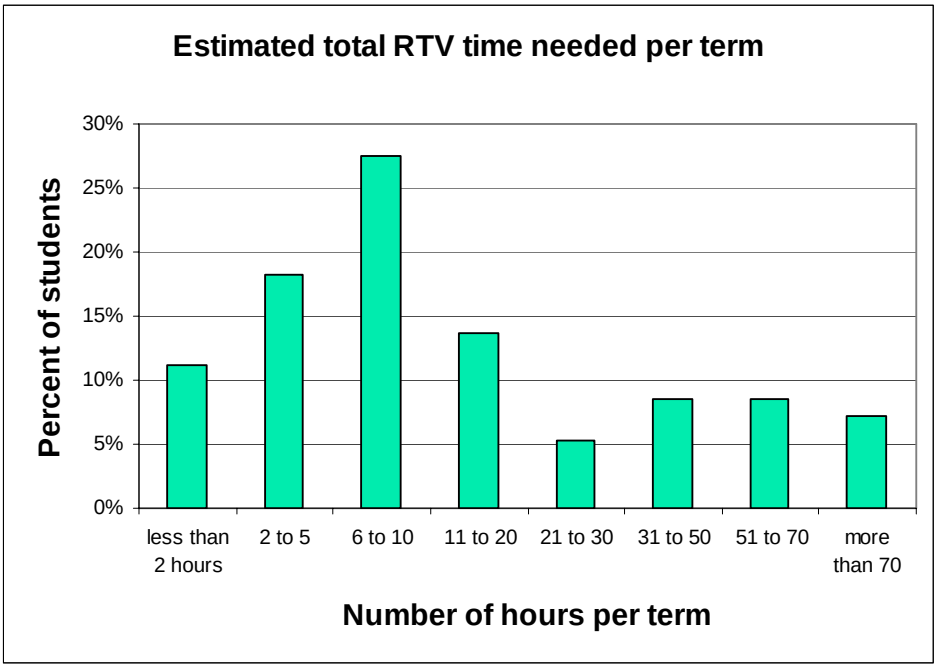


Figure 19. Distribution of the total RTV provision time perceived to be needed per student per term as estimated by RTVs (n=153)

Actual level of resource provision - RTV hours

As with the estimated "needed" hours of provision, the actual hours of provision by RTVs was divided into the five categories. Table 25 gives the mean and median values for these over the population, with the needed amounts repeated for comparison.

Table 25. Provided and needed services from the Resource Teachers: Vision. (n=153)

Number of hours per term:	Service **provided** per term Mean value (median)	Estimate of **needed** service per term Mean value (median)
Direct teaching	2 (0)	9 (0)
Assessment	1.1 (1)	1.8 (1)
Consultation	2.5 (1.5)	3.5 (3)
Programme provision and report writing	2.1 (1)	3.4 (2)
Preparation of materials	1.6 (0)	3 (0)
Total	10.3 (4.5)	22 (10)

The main shortfall occurs in the area of direct teaching. Many RTVs have estimated that the amount of time needed for direct teaching is considerably more than the student is receiving. Figure 20 shows the number of students with different levels of unmet service need as perceived by the RTVs. Note that

forty-seven of the 153 students (31%) are considered to be receiving a satisfactory level of service provision. Thirty students (20%) are assessed to need twenty or more extra hours service per term, which amounts to two or more hours per week.

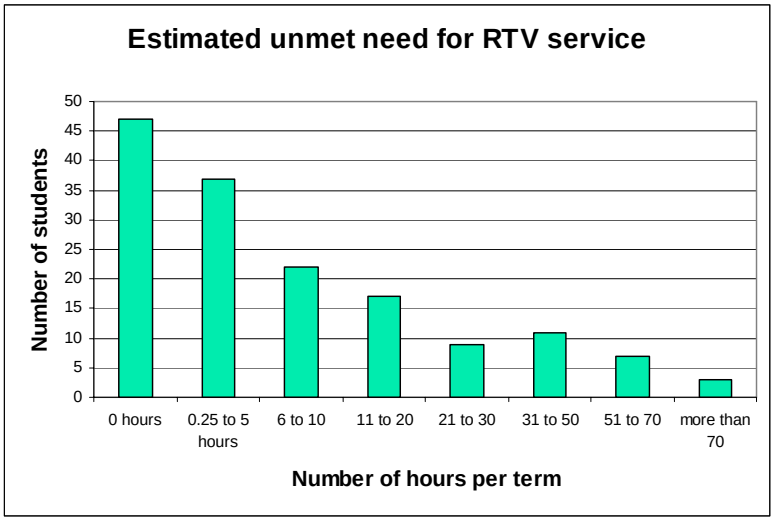


Figure 20. Level of unmet need – the difference between RTV service perceived to be needed and service provided. (n=153)

Over a third of the students (37%) in the VEA database receive no teacher–aide time. Eighteen students (12%) receive twenty-five hours a week or more, which is classed as "full cover" as the students are always accompanied by a teacher aide. The mean is nine hours per week, and the median eight hours per week. This figure came as a surprise when presented to a group of RTVs. Their perception was that the figures would be much lower than that.

ORRS teacher funding (0.2 or 0.1 of a teacher allocated to the school for each ORRS student) is used in a variety of ways for the thirty-eight students in the sample with High Needs (II) or Very High Needs (III). These are summarised in Table 26. There is a considerable difference between the provision for different students, where some receive a service from the RTV in addition to individual help from a teacher, while for others the ORRS funded teacher may have more of a supervisory role. The philosophy behind categorisation includes the concept of "unders and overs", where the funding is reallocated by fund-holders and schools in accordance with need. The strength of the system is that it can be tailored to the individual needs of students. A disadvantage is that the decisions are made by individual schools and it is not clear from the data that this is always done in an equitable manner.

Table 26. Use of ORRS teacher entitlements

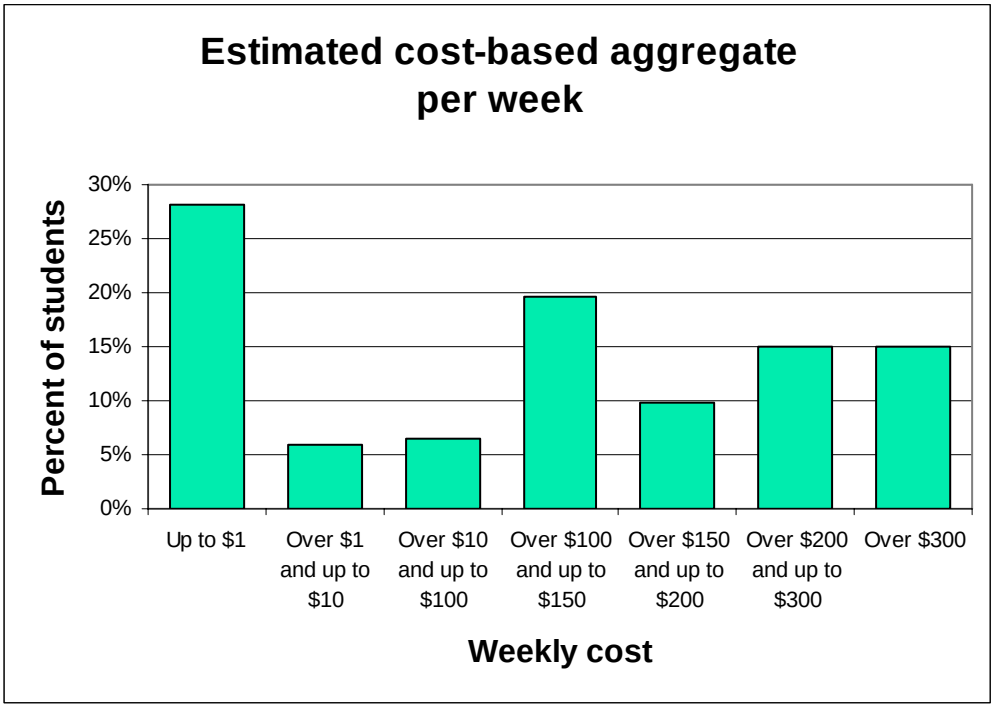
Use of funding	High Needs(II) (allocated 0.1 teacher = 2.5 hours per week)	Very High Needs(III) (allocated 0.2 teacher = 5 hours per week)
Special Needs Co-ordinator	8 students	2
Converted to teacher aide hours	6	1
Teacher – one on one tuition in Maths, Science or English	4	2
Transferred to fund RTV (All Elmwood VRC)	4*	1
Special needs support	4	
Staffing for Resource Room	2	1
Unclear or not used	3	
Total students	**31**	**7**

Note. Numbers refer to the number of students whose entitlement is used in this manner *Of the 4 for whom the entitlements are transferred, 3 are at the same school, and half is transferred and half remains at the school to provide individual support.

Cost-based aggregate (CBA) of service provision

An estimate of the cost additional to the mainstream provision per pupil per week was calculated by multiplying the teacher aide time by $10 an hour and the ORRS teacher and RTV time by $20 an hour. This provides a single measure, called the cost-based aggregate (CBA) that combines the different types of service provision. Figure 21 shows the cost-based aggregate and the number of students for each range of CBA, based on the VEA population. Note that services for over a quarter of the students cost less than $1 per week. At the other end of the scale, for some 15% of students the CBA was over $300 per week.

Figure 21. Estimated cost-based aggregate per week for learners with vision impairment (n=153)



The services received by the learners with vision impairment were mainly from RTVs, ORRS teachers and teacher aides. In some cases the ORRS funded teacher was the RTV, and in other cases the service was separate.

Provision and Need for Learners with Vision Impairment with Moderate Needs

The categorisation system has the effect of dividing the population into discrete units with regard to need and provision. There is probably a fairly continuous distribution of need within the population of students with special learning needs as a result of having a visual disability. However there is a discontinuity between the Moderate Needs (I) and the High Needs (II). The students who are not entitled to ORRS funding (those with moderate needs(I)) invariably receive no teacher aide assistance, whereas all but one of the students in the High Needs (II) category receive at least some teacher aide assistance. This is not to say that all of those with moderate special needs require extra help other than the occasional visit from the RTV, but rather it seems unlikely that only one of them would benefit from a few hours of extra assistance.

Generally the only provision for learners with vision impairment who have Moderate Needs(I) is visits from an RTV, at most once a term. The weekly cost-based aggregate for these students ranges from 0 to $1.80. The figures for provision and perceived need for learners with moderate needs (I) are listed

in Table 27. Some of the individual students will be considered to determine where their needs may not have been met.

Student 1 in Table 27 is a capable, highly motivated student, coping well in a mainstream setting. However the RTV has identified that he/she would benefit from thirty hours direct teaching and seven hours of assessment, consultation etc per term. At present student 1 is receiving one visit per term, which combined with report writing, takes up 2.5 hours. The RTV can see a need, but is unable, with current workload and priorities to meet it. This student rated his/her opportunity-to-learn as over 0 for all indices except Physical Skills, so the perceived level of educational opportunity is above the average for the regular population. However the RTV is able to see areas where some direct input would be of advantage to this student.

Similarly the RTV for student 2 in Table 27 perceived a greater need for service, including five hours of direct teaching, and six hours each for assessment, consultation and report writing. At present, student 2 is receiving one visit per term. Students 3 and 4 also had serious unmet need, though not to the extent of the first two. Student 5 was in a setting where economies of scale helped make sure that he/she received the help the RTV perceived was needed. This student also gained teacher aide assistance paid for out of another student's allocation. Half of these students were perceived by their RTV to have satisfactory levels of service provision.

Table 27. Needed and provided RTV hours per term for the twelve students with Moderate Needs in decreasing magnitude of needed provision.

Identifier	Needed total	Provided total
1	37.00	2.50
2	25.00	2.00
3	16.00	5.00
4	10.00	2.00
5	9.00	9.00
6	6.00	3.00
7	4.25	4.00
8	2.50	1.25
9	2.50	2.50
10	2.25	2.25
11	1.25	1.25
12	1.00	.00
Total N	12	12

7.3 Opportunity-to-learn for learners with vision impairment

This is where the first two phases of the research come together. The ESA test was the main measure of opportunity-to-learn for the learners with vision impairment. In addition, students were asked about the levels of service provision, students' opportunity-to-learn was compared with the parents' satisfaction with the quality of the students' education, and access to different subjects, an aspect of opportunity-to-learn, was also analysed.

Results of ESA test for Learners with Vision Impairment

The Essential Skills Access test (ESA) was developed to measure access to the curriculum, or opportunity-to-learn for all students, including those with vision impairment. The individual values for the nine indices were calculated from the students' responses for the eligible sample and scaled using the same scaling values as for the baseline group with no vision impairment. Thus a score of zero for an index equates to the average for the baseline sample for that index. The scores for the learners with vision impairment were then analysed as individuals and as a group, compared with the average scores for the twenty schools in the baseline sample.

On average, the students with vision impairment scored their opportunities higher than the baseline group of 1300 regular students. The areas in which they scored lowest were Physical Skills and Numeracy Skills, but these were not significantly lower than zero, the average for the regular population.

Table 28 summarises the ESA test index scores of the students with vision impairment, compared with the baseline scores. Note that the score is the number of standard deviations above the mean of the baseline sample. A mean of 0 indicates that the learners with vision impairment on average scored the same as the average for the baseline sample. A mean of 0.5 (which occurred for Communication Skills, Social and Co-operative Skills and Work and Study Skills) indicates that the learners with vision impairment score 0.5 standard deviations higher than the baseline sample. All but two of the mean index values were significantly higher than the average for the baseline group.

Table 28. Mean scores in ESA indices for the learners with vision impairment, in descending order of magnitude.

Index name	Mean scores relative to the baseline sample (Baseline sample mean = 0)
Communication Skills	0.5*
Social and Co-operative Skills	0.5*
Work and Study Skills	0.5*
Information Skills	0.4*
Problem-solving Skills	0.4*
Self-management and Competitive Skills	0.4*
Environment for Learning	0.4*
Numeracy Skills	0.2
Physical Skills	-0.2

Note. * indicates that the mean is significantly different from 0. (p=0.05)

The opportunities to develop physical skills for a young person with vision impairment in a mainstream setting, are lower than for the other skill areas. This is consistent with Lieberman & McHugh (2001) who found that "children with visual impairments are less fit than …(the) population of sighted children" (p. 281), and gave various recommendations to increase the level of involvement in physical activities for children with visual impairments.

The score for Numeracy is comparable with the average for the general population, but is low compared with the other indices for the learners with vision impairment. The other scores are consistently and significantly higher than the baseline group (as shown by scores significantly higher than zero). The implication is that in most areas learners with vision impairment are getting, on average, better opportunity-to-learn than the regular population, according to their perception.

When the students with vision impairment were analysed as a group, the averages treated as if they came from a single school and compared with those of the twenty schools, the group was in the top five for all but one index; for Physical Skills they ranked 18th out of 21. For the development of Work and Study Skills, the group of learners with vision impairment scored higher than any of the 20 baseline schools.

The high scores in the Work and Study Skills index may be due to the item "I am encouraged to work well", which 73% of the learners with vision impairment said was Very true, and 98% (all but one student) said was Very True or Somewhat True. This compares with the regular population with 46% saying it is Very True and 86% saying it is Very True or Somewhat True. This may be due to the more

labour intensive nature of the education for learners with vision impairment, which gives more opportunity for adults to encourage the student to work well. This possibility is explored further by looking at the relationship between SE2000 category and the response to this question. The percentage for whom this is "Very True" is 86% for VHN(III), 77% for HN(II) and 58% for Moderate needs(I). The percentage is lower for groups who have less service provision. This may also indicate a possible cause of stress for these students, if they are being encouraged more than they desire.

Other items within the Work and Study Skills index for which the response was significantly different for the learners with vision impairment compared with the regular population were "I can find out at school about the careers I'm interested in", "I can get help at school to know what my strengths are", and "I am aware of areas where I need to develop or improve." These results are summarised in Figure 22.

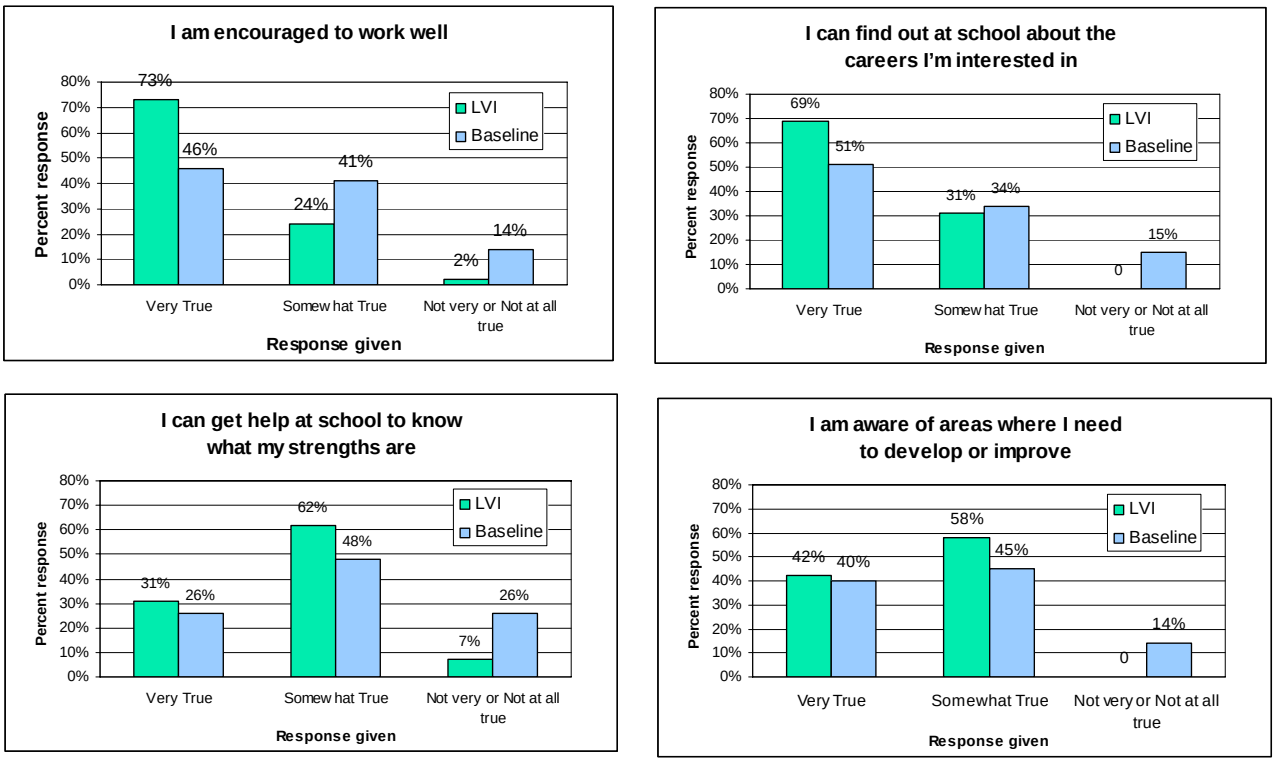


Figure 22. Work and Study Skills questions for which the learners with vision impairment answered differently from the regular population.

Gender Effect

As was the case in the baseline study, the boys scored lower on average in all indices than did the girls. The difference was statistically different for Communication Skills and Information Skills. The differences are listed in Table 29, along with the differences for the baseline sample for comparison.

For all but Information Skills, the differences in the mean scores between the boys and the girls is less for the learners with vision impairment than for the baseline sample.

Table 29. Differences in mean index scores between girls and boys for baseline and vision impaired samples

Index name	Baseline sample female – male (n=1300, 600 Female, 700 Male)	Vision Impaired sample female – male (n=45, 17 Female, 28 Male)
Communication Skills	1.0*	0.86**
Numeracy Skills	0.4*	0.05
Information Skills	0.4*	0.62*
Problem-solving Skills	0.3*	0.13
Self-management and Competitive Skills	0.6*	0.27
Social and Co-operative Skills	0.8*	0.27
Physical Skills	-0.1	0.11
Work and Study Skills	0.5*	0.21
Environment for Learning	0.2*	0.30

Note. * indicates that the mean is significantly different from 0. (p=0.05)

A positive value indicates that the girls scored higher than the boys.

Generally, the picture is positive for learners with vision impairment, in comparison with much of the regular school population. This is consistent with an opinion expressed by a Resource Teacher: Vision, in the preliminary study, that in some cases the learners with vision impairment are better off than their classmates who may have unidentified special needs. A parent, in informal discussion, suggested that her blind child had done better at school than his sighted brothers and sisters because he was not "distracted" by sport. It also seems that school is a much more important part of life for many of the learners with vision impairment, providing much of their social contact as well as learning opportunities.

It is instructive to look at the responses to the individual items that make up the indices in the ESA test and compare them with the responses from the baseline group. For five of the eighty-seven items the perception of opportunity for the learners with vision impairment was lower than that for the baseline group. Four of these items related to physical skills and cultural activities. The other item indicated that nearly half (47%) of the target group found that the work at school was never or almost never too easy for them. In comparison, only 28% of the baseline group found that the work at school was never or almost never too easy for them. It seems that the learners with vision impairment are much less likely to find the work too easy for them than their sighted peers.

For a further nineteen of the items, the response of the learners with vision impairment was significantly more favourable than that of the baseline sample. This reflected the generally positive attitude of the group towards school. In particular they scored higher for items related to Work and Study Skills (as shown before), and Social Skills. This may reflect the higher level of input that many of the students receive in terms of teacher and teacher aide time.

Parental Satisfaction and ESA Test Results

The parents' opinions of their child's schooling corresponded to the students' perception of opportunity-to-learn. Most parents (89%) were happy or very happy with the education their child was receiving. Most parents (90%) were also very happy or happy with the attitude of the school to their child. Only two parents felt the principal of their school was unsupportive to learners with special needs. This high level of satisfaction is similar to that described in the Education Review Office publication "The Resourcing Scheme for Special Needs Children"(Education Review Office, 2001), which stated:

> The great majority of parents indicated a high level of satisfaction with the service being provided by their school. (p. 7)

and

> Perhaps the most remarkable thing about the responses of the parents was the overall high level of satisfaction they expressed with the programmes provided by teachers and teacher aides. (p.10)

The correlations within the parents' responses are shown in Table 30. Generally parents who were happy with the education their child was receiving were also happy with the attitude of the school and the attitude of the principal. There was weak positive (r=0.38) or non-significant correlation between the level of family involvement and satisfaction with the school or principal.

Table 30. Correlations between parents' responses regarding provision and involvement.

	Happy with education child receiving	**Happy with attitude of the school**	**Attitude of the principal**
Happy with attitude of the school	r = .75** Nearly all positive. Almost one-to-one		
Attitude of the principal	r = 0.38* More than 75% consider principal as very supportive.	r = 0.44** Nearly all positive. Almost one-to-one	
Family involvement	r = 0.38* More of the "very involved" parents were very happy.	r = 0.24 No clear relationship	0.22 No clear relationship

Note. * denotes $p<0.05$, ** denotes $p<0.01$

The correlations between the level of satisfaction of the parents, and the level of opportunity-to-learn as measured by the ESA test indices are listed in Table 31. It is reassuring to note that there are no significant negative correlations, which indicates that the views of the opportunity-to-learn of the parents and the child are consistent. The students' perception of opportunity-to-learn appears to coincide with their parents' happiness with the school and the education they are receiving. This provides evidence of convergent validity of the ESA test index scores.

The highest correlation in Table 31 is between Physical Skills and the parents' happiness with the attitude of the school. Physical Skills are the most problematic for learners with vision impairment and a high score in this area could be an indicator of a school that is trying hard to meet the student's needs. The next highest correlation is between Numeracy Skills and the parents' happiness with their child's education. The two indices which scored the lowest overall for the learners with vision impairment (Phys and Num) are highly correlated with parental happiness with the attitude of the school and education. (See Table 28)

Table 31. Correlation between parents' perceptions and students' opportunity-to-learn

Index	**Parents' perception of family involvement**	**Parents happy with education**	**Parents happy with school attitude**
Communication Skills	0.14	0.08	0.00
Numeracy Skills	0.30*	0.37*	0.22
Information Skills	0.16	0.36*	0.31*
Problem-solving Skills	0.04	-0.01	0.08
Self-management Skills	0.30*	0.29	0.12
Social Skills	0.29	0.24	0.03
Physical Skills	0.10	0.35*	0.39**
Work and Study Skills	0.25	0.34*	0.18
Environment for Learning	0.37*	0.21	0.06

Note. * denotes $p<0.05$, ** denotes $p<0.01$

Student Satisfaction and ESA Test Results

Another aspect of opportunity-to-learn is the pupils' perception of whether or not they are receiving adequate service. At the start of the questionnaire the students were asked about the level of help received. Nearly all the students responded that the level of help from the teacher aide was "about right". This included students who have no teacher aide support and did not want any. Three students felt they did not get enough help from their teacher aide, and three other students felt they did not get enough help from the Resource Teacher: Vision (RTV). Nine students (20%) responded that they did not get enough help from an Orientation and Mobility instructor. (Several respondents had never received services from an Orientation and Mobility instructor.) One student responded that they got too much help from the teacher aide, and one responded that they got too much help from the RTV.

All of the students felt that the principal was "supportive" (62%) or "neutral" (28%) to learners with special needs. All but two of the students felt that their parents were either involved or very involved in their education. Under half (38%) of the students responded to the open-ended question, "What would help you to learn better at school?". The responses included things such as: "If teachers would be more organised and get materials into accessible formats earlier", "Handouts in large print on time", "A less noisy class, smaller class", "laptop is very useful", "If teachers didn't write in green pen sometimes. (on the whiteboard)". One student wrote a small essay about their experiences, mainly pointing out that the teacher aides and teachers under-estimated what they were capable of.

Subject Choice

During the preliminary study it was suggested that learners with vision impairment can be limited in the subjects they are permitted or encouraged to take. This is possibly a consequence of the preconceptions of parents and teachers of what the students can accomplish. The subjects taken by the students are listed in Table 32 with the numbers of times they appeared among the forty-three students for whom subject data was available. Students listed an average of 6.2 subjects each.

Table 32. Subjects taken by learners with vision impairment (43 students).

Subject	Total		Year 9 (n=18)	Year 10 (n=11)	Year 11 (n=14)
English	43		18	11	14
Mathematics	43		18	11	14
Science	39		18	9	12
Social Studies	24		16	7	1
Phys Ed	22		12	8	2
Music	11		7	2	2
Art	10		3	4	3
ICT/computing	9		4	1	4
Food	9		5	4	0
Foreign language	8		3	1	4
Tech drawing/graphics	8		4	2	2
History	7		1	0	6
Health	6		4	1	1
Economics	5		1	1	3
Technology	5		3	1	1
Drama	4		1	2	1
Sewing	3		2	1	0
Maori	3		3	0	0
Woodwork	2		0	1	1
Employment skills	2		1	0	1
Geography	1		0	0	1
Accountancy	1		0	0	1
Religious Education	1		1	0	0

Of slight concern is the small number taking Physical Education. Physical Education is a compulsory part of the curriculum for years 9 and 10, yet nine of the twenty-nine students in years 9 and 10 did not list Physical Education as a subject. This may warrant further investigation. As would be expected, the students who do not take Physical Education scored lower in the Physical Skills index. ($r= 0.3$ $p=0.05$).This is consistent with circumstances in other countries. Gronmo & Augestad (2000) pointed

out that “blind students in integrated, public schools are occasionally excluded from regular physical education classes.” (p. 522) (Chalifoux & Fagan, 1997) observed that “often, ‘less important’ subjects, such as physical education… are sacrificed to allow adequate time for remedial or resource room instruction.”(p 533) And Ponchillia, Strause, & Ponchillia (2002) also decried the lack of access to physical education in public schools for children with visual impairments. These comments apply to students in Norway, France, Canada and the United States.

One of the items in the ESA test directly addressed the question of subject choice, “I am able to take the subjects I want to”. There was no statistically significant difference in the responses between the learners with vision impairment and the baseline sample. (p=0.093). Fifty-three percent of the learners with vision impairment said this was Very True, and 89% said it was Very True or Somewhat True. This compares with the general population, of whom 38% said it was Very True and 78% said it was Very True or Somewhat True.

Figures were available from the New Zealand Qualifications Authority website (New Zealand Qualifications Authority, 2004) of the number of students entering different subjects at level 1 (Year 11) in 2003. The number taking English was used as the denominator, and the percentages taking other subjects calculated. This gives an indication of the percentage of students in the New Zealand population who take each of the subjects in the general population. In Table 33 the percentages from the sample are compared with the national percentages.

Table 33. Year 11 subjects for learners with vision impairment compared with the general population.

Subject	Number of learners with vision impairment in Year 11 taking this subject	Percentage of learners with vision impairment in Year 11 taking this subject	Percentage of general population taking NCEA
English	14	100%	100%
Mathematics	14	100%	95%
Science	12	86%	83%
History	6	43%	21%
Foreign language	4	29%	17%
Art	3	21%	26%
Economics	3	21%	19%
Music	2	14%	7%
Geography	1	7%	27%
Social Studies	1	7%	3%
Maori	0	0%	5%

History, foreign languages and music appear at a higher rate among learners with vision impairment than among the general population, while geography appears at a lower rate. It may be that students with vision impairment choose or are encouraged to take subjects which are less visual, such as languages and history, rather than geography, which has a large visual component. It is also interesting that the proportion taking Practical Art is not much below the norm, though learners with vision impairment might be considered excluded from Visual Art. However this is a small sample, so the results must be treated with caution. Later consultation with RTVs confirmed that learners with vision impairment are sometimes discouraged from taking Geography as it is considered to have too much of a visual component.

7.4 Opportunity-to-learn in Relation to Student Characteristics and Service Provision

Determinants of Provision Level

Many factors were postulated in the preliminary study as having an influence on the level of need for provision. Some, including level of vision-impairment and other disabilities are taken into account in the verification process that assigns to each student an ORRS categorisation.

In the absence of more detailed measures of student characteristics, the SE2000 designations (Very High Needs (III), High Needs (II) and Moderate Needs(I)) were used to represent the level of need. This reduced the level of precision. As the SE2000 category determines the level of funding, it is difficult to know whether the provision of services is a function of actual need or of the category. This categorisation is used as a proxy variable for the students' individual characteristics, assuming the validity of the verification process that assigns the category. Within each group the level of need will differ according to other circumstances. Each category covers a range of need.

Other characteristics which may contribute to the difference in provision level within the SE2000 categories were investigated. This was evaluated by exploring linear regression models, for groups (II and III), with the dependent variable being weekly cost, and the potential predictors representing gender, ethnicity, year level, family involvement, the child's personal characteristics, time to travel to the school from the VRC, decile of the school, whether there was a computer at home and the number of years experience the RTV has. For both groups there were no significant predictors at the 0.05 significance level.

The distribution of resourcing for boys and girls was analysed. Table 34 lists the mean, standard error and 95% confidence intervals for the weekly cost for the three funding categories, divided into boys and girls. There are no effective differences between the average funding for boys and girls.

Table 34. Weekly Cost-based Aggregate by gender and funding category

Dependent Variable: weekly cost

SE2000 status	sex	N	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Very High Needs	Girl	2	300.4	34.2	231.3	369.5
	Boy	5	306.3	21.6	262.6	350.0
High Needs	Girl	9	135.1	16.1	102.5	167.7
	Boy	17	142.0	11.7	118.3	165.7
Moderate Needs	Girl	6	.533	19.7	-39.4	40.4
	Boy	6	.625	19.7	-39.3	40.5

Year Level

In the preliminary research it was suggested that the level of resource provision might differ from year to year, because of transition to high school in Year 9 and examination issues in Year 11. For this reason it was thought that Year 9 and Year 11 might have a higher level of funding than Year 10. This does seem to be the case to a limited extent. We need to be wary of drawing any large conclusions though, as partitioning the data results in very small groups.

Table 35. Weekly Cost-based Aggregate by Year level and funding category

Dependent Variable: CBA

SE2000 status	Year level	N	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Very High Needs	9	1	324.8	49.0	224.5	425.1
	10	2	264.5	34.6	193.5	335.5
	11	4	303.1	28.3	245.2	361.0
High Needs	9	13	138.0	14.0	109.4	166.6
	10	6	130.9	20.0	90.0	171.9
	11	7	132.2	26.5	78.0	186.4
Moderate Needs	9	5	.825	22.4	-45.0	46.6
	10	3	.625	30.0	-60.8	62.1
	11	4	.413	24.5	-49.8	50.6

There were no factors identified that explained the variation in the level of resource provision within each of the categories.

Relationships Between SE2000 Categorisation and Opportunity-To-Learn

This is where the ESA test proves most useful. The ESA test scores were compared relative to the SE2000 categories, Moderate Needs(I), High Needs(II) and Very High Needs (III). Figure 23 is a box-plot of the scores for the nine indices, by SE2000 categories. It gives an indication of the distribution of the individual scores, compared with the average for the baseline (shown by the line at zero). There is a high degree of overlap between the three categories in all but the Physical Skills index, indicating that variation within the categories is generally greater than the variation between categories. Note that line in the middle of each box-plot is a median. The median scores differ from the mean scores as the group sizes are small, and the distributions are skewed.

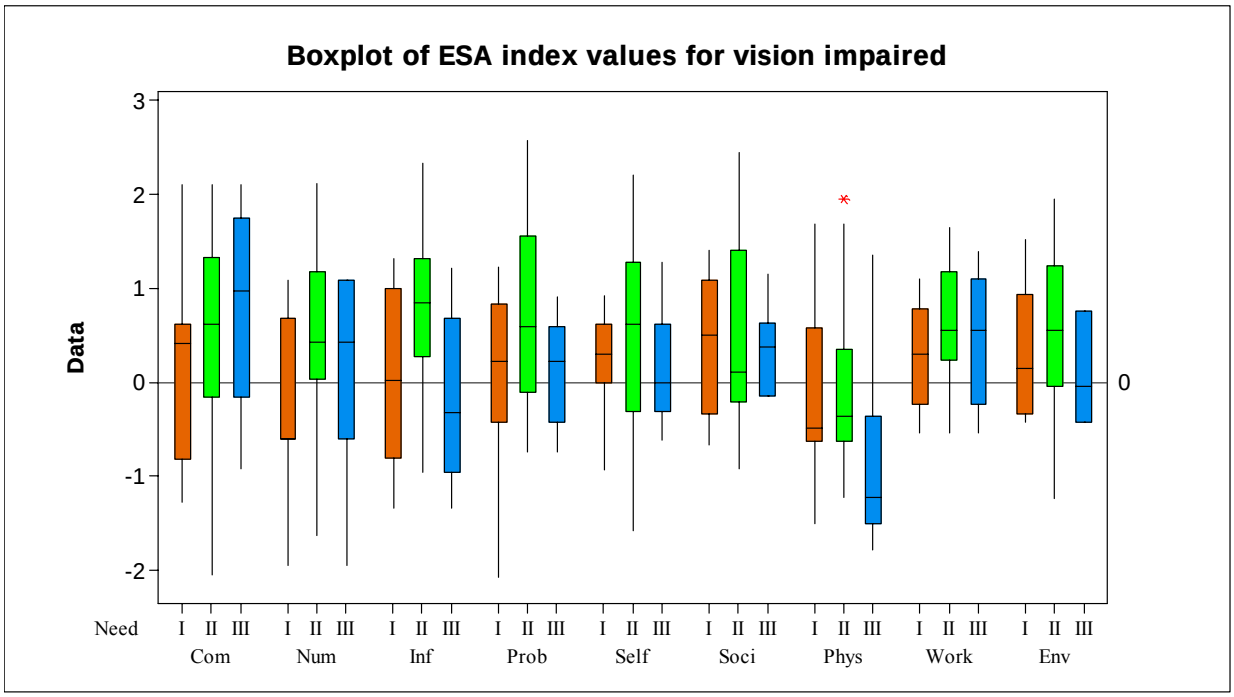


Figure 23. Comparison of opportunity-to-learn for the three SE2000 categories

The mean index scores for each category for each of the indices is given in Table 36. The difference in means between High Needs and the other groups was greatest for Information Skills, followed by Physical Skills. The mean score for students who were blind (VHN – (III)) was higher than the for the other groups for the Communication Skills index. In all other indices the High Needs(II) group had the highest mean score.

Table 36. The mean and median index scores for the three funding groups.

Index scores	Moderate Needs (I)		High Needs (II)		Very High Needs (III)	
	Mean	Median	Mean	Median	Mean	Median
Communication Skills	0.19	0.4	0.51	0.61	**0.76**	**0.97**
Numeracy Skills	-0.17	-0.60	**0.49**	**0.43**	-0.02	0.43
Information Skills	0.09	0.02	**0.68**	**0.84**	-0.05	-0.33
Problem-solving Skills	-0.02	0.22	**0.76**	**0.59**	0.15	0.21
Self-management and Competitive Skills	0.20	0.30	**0.53**	**0.61**	0.13	-0.01
Social and Co-operative Skills	0.42	0.50	**0.57**	**0.11**	0.33	0.37
Physical Skills	-0.18	-0.49	**-0.11**	**-0.36**	-0.82	-1.23
Work and Study Skills	0.27	0.30	**0.67**	**0.55**	0.44	0.55
Environment for Learning	0.28	0.14	**0.59**	**0.54**	0.13	-0.05

Note. **Bold** indicates the highest mean or median value for that index.

The consistently highest scores for the High Needs (II) students in all but Communication Skills would suggest that they are benefiting the most from the resource provision. It may be that no matter what resources are given to the totally blind students, they will not achieve the same level of access to the curriculum as the High Needs(II) category. The students with no ORRS funding (Moderate need (I)) appear the worst off. It could be suggested that they are simply like the general population, with little extra resourcing, and moderate special needs in the main.

Identifying Effective and Ineffective Practice - Best and Worst Results

Though the index values identify various different aspects of the curriculum there is some value in combining them to identify which students get the best overall opportunity-to-learn in each of the SE2000 categories. From this value it may be possible to find areas of effective practice with regard to resource and service provision.

In order to gain insights into good practice, the students scoring highest and lowest in each group will be examined. In Table 37 the forty-five students are listed with the sums of their index scores. This is shown graphically in Figure 24. The highest scores occur in the High Needs (II) category, with sums of ten and more. These are considerably higher than those for the Very High Needs(III) and Moderate Needs (I) Category. Comparing the mean of the High Needs (II) group with the other two groups combined yields a t statistic of 5.7, with associated p-value of 0,021, indicating that the mean of the High Needs group is higher than for the other two groups.

Table 37. Total opportunity-to-learn scores by SE2000 group

Moderate Needs (I)			High Needs (II)			Very High Needs(III)		
Student	Sum of index scores	Cost-based aggregate	Student	Sum of index scores	Cost-based aggregate	Student	Sum of index scores	Cost-based aggregate
1	7.00	.40	13	18.76	140.90	39	7.76	330.80
2	6.28	.25	14	11.49	118.00	40	5.70	270.00
3	5.98	.50	15	10.98	161.20	41	1.96	269.00
4	4.20	.50	16	10.58	185.20	42	.21	381.60
5	3.86	.40	17	10.23	151.20	43	-.45	198.20
6	2.30	.00	18	10.10	100.45	44	-2.11	324.80
7	-1.10	.80	19	9.05	200.30	45	-5.65	358.00
8	-1.70	.60	20	8.50	10.30			
9	-2.25	.25	21	8.13	162.00			
10	-2.77	.45	22	7.53	130.20			
11	-4.18	1.80	23	6.12	151.20			
12	-4.82	1.00	24	2.98	100.45			
			25	2.74	116.40			
			26	2.68	151.70			
			27	2.52	101.45			
			28	2.41	151.60			
			29	2.22	173.80			
			30	2.05	91.20			
			31	1.43	244.40			
			32	.92	130.50			
			33	.74	150.40			
			34	.72	151.20			
			35	-.10	111.25			
			36	-2.80	269.00			
			37	-3.11	74.40			
			38	-4.79	100.60			

The students with moderate needs have been discussed previously with regard to unfilled need for service. The range of opportunity-to-learn and cost are similar to the regular population.

Several of the High Needs students (shown in red in Figure 24) scored very highly for their overall opportunity-to-learn. The outlier, student 13, scored higher even than any of the students in the baseline sample. This student loved school. Five others with High Needs also had a total opportunity-to-learn score of over 10. The provision, represented by the cost-based aggregate, for these six students is not identifiably different from the other students in the High Needs(II) category. Five of the

six top scorers had parents who were happy with the education, all of the students thought the principal was supportive, three were boys and three were girls, two were from each year level, four of the six had additional disabilities, compared with seven of the twenty who weren't in the highest group.

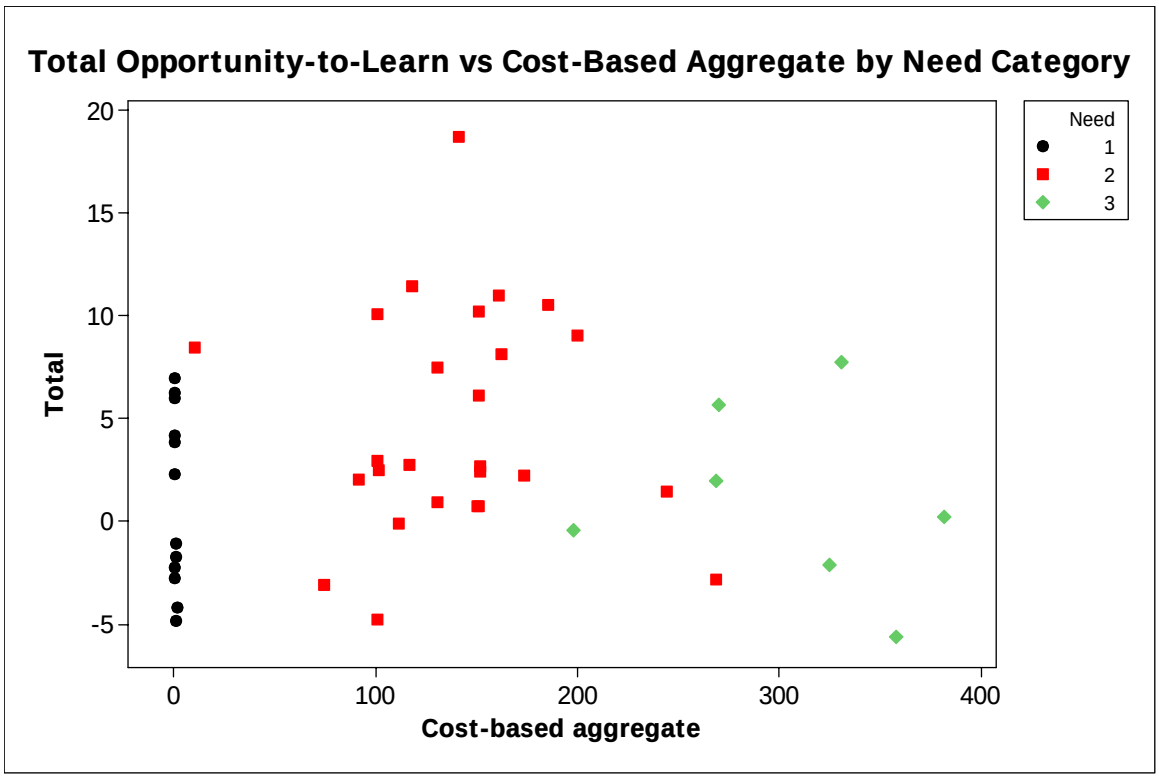


Figure 24. Total Opportunity-to-learn compared with the cost-based aggregate provision, shown in the SE2000 Need groups

Within the Very High Needs(III) students, Student 39, who scored the highest, is not blind and does not have other disabilities, and possibly would be better compared with the High Needs (II) category for this analysis (the student's level of vision was unstable at the time of verification as Very High Needs (III); thus the classification). Student 40, who scored the highest of the students who use braille, receives 15 to 20 visits a term from his/her RTV, and in addition receives five hours per week help in mathematics and science from an ORRS funded teacher. The student receives fifteen hours per week of teacher aide time from a very competent teacher aide, with adequate braille knowledge. The student is of average ability, and motivation. In contrast we can examine Student 45, who scored -5.65, the lowest of the students who use braille. Student 45 receives twenty visits per term, some of which is funded out of the ORRS allowance, and twenty-five hours per week of teacher aide time from a teacher aide who is very competent, and proficient at braille. Student 45 is adventitiously blind, and was more aware of his/her disability than the other students who use braille. The next lowest of this

group, student 44 received 15 visits per term from the RTV, but was receiving nearly all of his/her braille instruction from the teacher aide, who is employed for thirty-one hours per week. There was no designated ORRS teacher, nor was the time signed over to the Resource Centre. This is probably funding extra hours for the teacher aide. This is a small sample, from which it is unwise to draw many conclusions. However it does seem that there is a considerable range of service levels, as indicated by the cost-based aggregate scores, within this group of students with Very High Needs(III).

Explanatory Models for the Index Scores

Finally an attempt was made to find a model, linking student characteristics, service provision and opportunity-to-learn. For each of the nine indices for opportunity-to-learn, a regression model was fitted. The results were mixed and provided little more information than what has already been reported. As the sample size was small (n=45) and there was a wide variation in level of need, but only a narrow band of scores with regard to opportunity-to-learn it is inadvisable to draw many conclusions from the results. Models were developed using stepwise regression, and using trial and error on suitable explanatory variables, based on the theoretical grounding from the earlier qualitative study.

The full list of variables that were considered for all the models is included in Appendix 14. Models were fitted both with and without the students who learn braille. In most cases (not Communication Skills) the models with and without braille students differed only in the magnitude of the coefficients of the predictor variables. There was considerable collinearity between the candidate variables, such as between the parents' and the student's assessment of the principal's attitude. However there is no evidence of collinearity in the variables included in each of the individual models. Residual plots were examined, and there were no obvious outliers in the data. Table 38 gives an overview of the models for the nine indices. It shows patterns indicating variables that occur in several of the different models. Three of the models are interpreted, as are the explanatory variables that were found to be statistically significant.

Table 38. Summary of models of ESA indices for the learners with vision impairment

	Com	**Phys**	**Self**	**Num**	**Inf**	**Prob**	**Soc**	**Work**	**Env**
Rsq	68%	55%	44%	25%	27%	31%	26%	23%	24%
Constant	2.52	7.01	4.73	-1.08	0.43	3.47	2.24	1.65	1.80
Gender	-0.84 (0.19) *-0.42*				-0.68 (0.24) *-0.37*				
computer	0.70 (0.30) *0.23*								
Stuprinc	1.23 (0.20) *0.63*		0.64 (0.21) *0.37*				0.78 (0.24) *0.43*	0.38 (0.17) *0.30*	0.51 (0.21) *0.34*
CBA	0.002 (0.001) *0.27*								
Famsize	-0.27 (0.08) *-0.35*								
Year level		-0.68 (0.12) *-0.62*	-0.32 (0.12) *-0.33*						
Meddec		0.43 (0.2) *0.23*							
par school		0.39 (0.16) *2.5*							
Parfam or stufam			0.51 (0.15) *0.41*				0.43 (0.17) *0.33*	0.41 (0.15) *0.38*	0.42 (0.15) *0.39*
Pakeha			0.62 (0.24) *0.32*						
Advocacy skills				0.47 (0.17) *0.38*					
High needs				0.59 (.26) *0.31*	0.70 (0.24) *0.39*				
math class size						-0.11 (0.03) *-0.55*			

Note. Only those coefficients included in the particular model are included in the table. All have a p-value lower than 0.05. The values of the standard errors are given in parentheses, followed by the Beta values in *italics*.

Model for opportunity-to-learn Communication Skills

The model for Communication Skills had the highest Rsq value, 68%, meaning that 68% of the variation in the Communication index score is explained using this model. The model is as follows, with the standard errors of the coefficients given in brackets under the coefficients:

$$\begin{array}{lccccccc} \textbf{Com} = & 2.52 & -0.84\ \textbf{Gender} & +0.70\ \textbf{Computer} & +1.23\textbf{Stuprinc} & +0.002\textbf{CBA} & -0.27\ \textbf{Famsize} \\ & (0.50) & (0.19) & (0.30) & (0.20) & (0.001) & (0.078) \end{array} \quad (10)$$

The coefficient for **Gender** indicates that, other things being equal, girls score 0.84 higher than boys for the index for opportunity-to-learn Communication Skills. The value for this coefficient is nearly twice the value of the coefficient in the model for Communication Skills using the baseline ESA data. The coefficient for **Computer** indicates that a student who has a computer at home has greater access to learning Communication Skills. However, there are only five students who do not have access to a computer, four of whom are Maori or Pacific Island students. The computer variable may be acting as a proxy for socio-economic status or ethnicity.

The coefficient that occurs the most often, in five of the index models, is **stuprinc**, corresponding to the student's perception of the principal as supportive, or neutral. No students responded that the principal was not supportive. In this model the student having said the principal was supportive corresponded to scoring 1.23 higher than if they said the principal was neutral. This is a strong effect. There is a complicating factor in that both the outcome measure and the input measure are based on the students' perceptions. Though the relationship is one-way for the influence of a principal's supportiveness on a child's opportunity-to-learn, the same is not necessarily true for the students' perception of these two things. It is reassuring that there was strong correlation between the students', the parents' and the RTVs' assessments of the supportiveness of the principal, but they too may be influenced by the opportunity-to-learn that the student receives. The hypothesis was that the principal's attitude to learners with special needs will affect the opportunity-to-learn for the student. It does appear that this might be the case.

The variable **CBA** or cost-based aggregate occurs once in the nine models, in the Communication Skills index. The coefficient of 0.002 implies that an extra $10 per week of resource provision will increase the index score by 0.02, other things being equal. It may be that the coefficient of **CBA** is significant for the Communication Skills index because the Very High Needs(III) students scored highly in the Communication Skills index and have high levels of resourcing, leading to high **CBA** values. When the model is run again on the sample with the VHN (III) students removed, the effect disappears.

The coefficient of **famsize** indicates that an increase of family size of one child corresponds to a decrease in the index for Communication Skills of 0.27.

Of the five significant predictors of opportunity-to-learn Communication Skills, three (**gender**, **computer** and **famsize**) are measures of student characteristics and the other two are arguably measures of provision.

Model for opportunity-to-learn Physical Skills.

The model for Physical Skills had the next highest Rsq value of 55%, meaning that 55% of the variation in the index score is explained using this model. The model is as follows:

Phys =	7.01	–	0.68 **Year**	+	0.43 **Meddec**	+	0.39 **Parsch**		(11)
	(1.16)		(0.12)		(0.2)		(0.16)		

It is not surprising that **Year** is a significant predictor of opportunity-to-learn Physical Skills, as the participation in Physical Education decreases as the students move up through the school. According to this model, the index score decreases by 0.68 for each year, all other things being equal. Students in medium decile schools (compared with High or Low decile schools) have on average 0.43 higher index scores for Physical Skills.

Parsch (Parents' rating of how happy they are with the attitude of the school to their son or daughter) is similar to **stuprinc** in being a subjective judgement. This variable reflects the relationship identified earlier between the parents' assessment of the school and the students' opportunity-to-learn Physical Skills. For each increase in score by one level (eg Happy to Very Happy) the Physical Skills index score increases by 0.39.

Model for opportunity-to-learn Self-management and Competitive Skills.

The model for Self-management Skills had an Rsq value of 44%. The model is:

Self	= 4.73	-	0.32**Year**	+	0.64**stuprinc**	+	0.62 **Pakeha**	+	0.51**Parfam**	(12)
	(1.28)		(0.12)		(0.21)		(0.24)		(0.15)	

The student's rating of the principal as supportive, as opposed to neutral, is associated with an increase in index score of 0.64. This effect was discussed under the Communication Skills model. Similarly to the Physical Skills index, the score for Self-management Skills decreases by 0.32 for each **Year**. This may indicate that the students feel less positive about school and learning when they have been at

school for longer. Students who are **Pakeha** (75% of the sample) have an increased score by 0.62 compared with Maori, Pacific Island and other, other things being equal.

The coefficient of **Parfam** indicates that higher levels of involvement of the family in the child's education (as perceived by the parents) corresponds to greater opportunity-to-learn related to Self-management Skills. Measures of family involvement are also significant in the models for Social Skills, Work Skills and Environment for learning.

Commentary on models for opportunity-to-learn

The three strongest models give limited insights. The models for the other six indices do not provide any further insights. It is useful to discuss why the models are not performing as desired.

An issue to consider is the range of variability within the data. As is the case in observational data for educational research, the full range of possible theoretical values is not represented in the sample. It would be ethically unacceptable to provide a greatly reduced service to a student in order to assess the effect on opportunity-to-learn. As there was perceived to be a reasonably wide range of service provision due to local variation in service delivery levels and caseloads throughout New Zealand, it was thought that this would provide enough variation in the data for developing a model. If there were cases where students were getting considerably less provision than they needed, then this might have shown up.

The factors that were thought to have a potential effect of opportunity-to-learn, related to the individual nature of the student and the setting do not appear as significant in the models. Some of the aspects that do affect opportunity-to-learn for learners with vision impairment are similar to those that affect opportunity-to-learn in the general population, namely gender. It is unclear whether it would be acceptable to develop a policy that provides a higher level of service to male students.

The mathematical models of the inputs and outcomes (opportunity-to-learn) for education of learners with vision impairment were of limited value. Few relationships showed up between the opportunity-to-learn, resource provision and the potential determinants of need. This can be due to several things: limitations of the outcome measure, lack of a relationship in the population, and small sample size. The instrument may not be precise enough to measure individual variation and the measurement error is adding to the natural variation. It may be that there is very little actual relationship between the determinants of need and the provision or opportunity once the effect of the SE2000 categorisation is removed. Another explanation is that the sample is too small and the variation too great between the individuals to show up any general pattern. This last explanation has been cited in research literature

as a reason for the lack of quantitative research regarding learners with vision impairment. (Dote-Kwan & Chen, 1995)

Another problem was with the small size of the sample, as it is generally accepted that the sample need to contain at least ten observations for each predictor variable. Though none of the resultant models had more than four variables, using stepwise regression on a small data set, with a large set of independent variables to choose from, can lead to overfitting. Thus, the models here may describe the relationships that exist in the sample data, but have little relevance in explaining variation in the population. This exploratory analysis has provided information that could be used for collecting data on a more limited set of variables, for a larger sample, that might lead to more satisfactory results.

Some of the variables that appear to have a large effect on opportunity-to-learn, may in fact depend on opportunity-to-learn. As discussed earlier, **stuprinc** appears in several of the models and has a strong explanatory effect on the index values. It may well be that whether the student rates the principal as supportive or neutral to students with special needs reflects their own personal experience at the school, which is also measured by the ESA test. Both **stuprinc** and the index values may be measuring aspects of satisfaction with the school experience. It would be helpful to find a less subjective way of measuring principals' supportiveness to students with special needs.

It is debatable whether there was justification for proceeding with the analysis of the explanatory models as the dataset is not large enough. This was attempted for the sake of completeness as an initial aim of the research as a whole was to develop these models. The analysis was exploratory and provides information that may be useful for further research. Though the resultant models themselves are of limited value, there is much useful information that has been gleaned from the data. The comprehensive descriptive statistics reported in the rest of the chapter provide a detailed portrayal of education for learners with vision impairment in Years 9 to 11 in New Zealand, and rich information to guide decision-making.

Implications for Case-loads

The current level of resource provision appears to be satisfactory for most students in the sample, with regard to access to the New Zealand curriculum. The results suggest that the students with vision impairment have better than average perceived opportunity-to-learn the regular curriculum, with the exception of Physical Education and possibly Numeracy. However the ESA test measures opportunity-to-learn the Essential Skills of the New Zealand curriculum, but does not specifically address the needs of students who are vision-impaired. Studies of itinerant teachers in the United States of America indicated that most RTVs were spending most of their direct teaching time teaching and tutoring in the regular curriculum and focussing on general academic skills, rather than disability-specific skills (Griffin-Shirley et al., 2004; Wolffe et al., 2002). Examples of disability specific skills are braille code, visual efficiency skills and social skills. With similar-sized or larger case-loads for New Zealand RTVs it is reasonable to suggest that this may also be the case here.

Notwithstanding, the figures given for provided RTV time are an indicator of the amount of time that is needed to enable access to the New Zealand curriculum. The levels were displayed in Table 24, and the suggested time allowances, based on these findings are summarised in Table 39. The figures in brackets are the average number of hours that the RTVs estimated as being needed to provide the level of input that is desirable (or ideal?). This would facilitate the teaching of the Expanded Core Curriculum for learners who are blind or low vision, the disability specific skills including social interaction skills, independent living skills, recreation and leisure skills, career education; technology, and visual efficiency skills, in a more focussed way than at present.

Table 39. Suggested average time allowances, based on current practice, for students with vision impairment in Years 9 to 11

	Moderate Needs (I)	**High Needs (II)**	**Very High Needs (III)**
Number of visits per term by RTV	1 visit	2 visits	15 visits
Hours RTV service per term based on current service.	3 hours	9 hours	45 hours
(average estimated to be needed)	(10 hours)*	(22 hours)	(73 hours)
Teacher aide hours per week	0 hours	10 hours	23 hours

Note. *The figures in brackets are the average estimates of need, as judged by RTVs.
The other figures are based on current practice.

Summary of Part C – Application area: Learners with vision impairment

In Chapter 6 a model was proposed, expressing opportunity-to-learn as a function of the individual student characteristics and the educational provision.

$$O_i = \beta_0 + \beta_1 S_i + \beta_2 P_i + \varepsilon_i \quad (13)$$

In order to estimate the model, information was needed about the nature of the student characteristics and the provision. The level of resourcing is linked to the level of need, and the values for opportunity-to-learn in the learners with vision impairment is similar to those of the general population. Considerable information regarding the nature of the population, provision and opportunity-to-learn was generated.

The following results summarise the findings from the analysis.

Student Background Characteristics

- The sample included seven students with Very High Needs (III), thirty-one with High Needs (II) and twelve with Moderate Needs (I).
- The sample was approximately representative of the population with regard to gender, year level, and ethnicity except that the Pasifika population was not well represented.
- Most of the students had access to a computer at home.
- The sample exhibited the full range of self advocacy, ability, social interaction with both adults and peers, and attitude.
- Families were almost all either involved or very involved in their children's education, and nearly all Individual Education Plan (IEP) meetings were attended by at least one parent.
- There was a smaller proportion of students in high decile (low social deprivation) schools than occurs in the general population.

Needed and Received Provision

- All the students rated their principal as supportive or neutral to students with special needs.
- Many of the students thought they did not get enough help from an Orientation and Mobility Instructor. The level of help from RTVs and teacher aides was "about right" in nearly all instances, according to the students.
- The average school roll size for the sample of learners with vision impairment is similar to that for the general population.
- There are no more pupils with high levels of need in the schools attended by learners with vision impairment than in the general population. Schools were vague in reporting numbers of students getting assistance from the Special Education Grant (SEG).
- The distribution of the classroom teacher's experience is the same for learners with vision impairment as for the regular population.
- Just under half of the classroom teachers surveyed were teaching a student with vision impairment for the first time.
- The classroom teachers would have liked more information and training to teach a learner with vision impairment.
- The number of hours of perceived needed service, as estimated by RTVs is considerably greater than the number of hours of service provided, particularly with regard to direct teaching.
- Thirty percent of students in the VEA database receive services estimated as costing over $200 per week.

Opportunity-To-Learn for Learners with Vision Impairment

- For seven of the nine ESA indices the learners with vision impairment scored higher on average than the baseline group (n=1300) who had no identified special needs.
- The two indices in which learners with vision impairment scored lowest were Physical Skills and Numeracy Skills.

- As a group, the learners with vision impairment scored better than any of the baseline schools for Work and Study Skills, and worse than all but three of the schools for Physical Skills.
- The girls scored higher on average than did the boys for all indices.
- Parental satisfaction with the school and education was positively correlated with the ESA index scores.
- Compared with the regular population, learners with vision impairment were less likely to take Physical Education and Geography, and more likely to take History, a foreign language or Music at Year 11.
- Students in the High Needs Category (II) generally had greater perceived opportunity-to-learn than students in the Very High Needs (III) or Moderate Needs (I) categories.
- Learners with vision impairment had reduced opportunity to develop physical skills, partly due to a number of them not taking Physical Education.

The final research question asked whether an instrument that uses student perceptions to measure opportunity-to-learn could be used for evaluating services in special education. The ESA test results provided valuable information regarding opportunity-to-learn for learners with vision impairment compared with the regular population. In particular they provided a comparison between students in the different funding categories. The results were consistent with parental opinion. The index scores were used to identify areas of effective and ineffective practice, and possible inequities of provision particularly with regard to braille students. The areas that were least well catered for, Physical Skills and Numeracy Skills were identified. The answer to the research question is that an instrument that uses student perceptions to measure opportunity-to-learn can be useful in evaluating services in special education.

7.5 Limitations and additional insights

Data Choice and Collection

The data is not a random sample, but rather it is all the students from the population who gave consent and whose parents gave consent to participate in the research. Furthermore, as has been discussed previously, the small size and heterogeneous nature of the population and sample make generalising difficult. In addition, the people in the sample self-selected, by giving consent to participate. This may result in a group which is not representative of the population as a whole. This concern has been alleviated to a certain degree by having access to data for the population in the VEA database with which to compare the sample.

The guest editor for a special edition on outcomes for the Journal of Vision Impairment and Blindness summed up the challenges:

> Outcomes measurement for people with visual impairments poses many special measurement problems – such as small sample sizes, the diversity of characteristics among people with visual impairments, and the diversity of interventions – that must be accounted for to obtain accurate and meaningful information. (McMahon & Moore, 2002, p. 259)

Critique of Variables

About half of the variables were subjectively measured. This introduces possible bias into the analysis.

Parents were asked how happy they were with their child's education and with the attitude of the school and to rate the principal's supportiveness. These are clearly subjective measures. It is worth considering how likely a parent is to say that they are very unhappy with their child's education. This could imply that the parents ought to do something about it, or they are being "bad parents". Thus there may be an upward bias to these responses, in that the parents overstate their satisfaction. Parents were also asked how involved they were in their child's education. These responses may not be indicative of the population, as a parent responding to such a voluntary questionnaire may be more likely to consider themselves very involved in their child's education.

The RTVs were asked to estimate the number of hours of service provided and needed. As discussed in Section 7.2, the estimates of need may have been influenced by the effects of political action and current practice. Further work is needed, particularly now that the Resource Centres are part of a single organisation, in order to develop a shared understanding of the role of the RTV and the level of

service needed for the different students. It is also possible that the estimates of provision are biased. It could be possible to get more objective data using work diaries. The limitations of this data have been taken into account.

Comments on Student Input

A benefit of the "hands-on" approach was that it made it possible to get a fuller picture of what these young people were like, and some incidental information from them and from the schools. It was a privilege to meet these students and be allowed to understand a little of their world.

The question "Is there anything about you that makes it difficult for you to learn at school?" had been used in the baseline study in an attempt to identify students with special needs in the regular population. Of the students with vision impairment, who clearly did have special needs, 12 out of the 45 (27%) responded in the negative, that there was nothing about them that made it difficult for them to learn at school. This does suggest that some students with vision impairment may have lower expectations than the regular population, as they may be less aware of what they are missing out on.

Most of the participants were very articulate and happy to talk to me. They appeared to think carefully about the questions and occasionally asked for clarification. Almost without exception, the young people who were interviewed really liked school. If I had received these responses without actually having been there to ask the questions, I might have doubted the responses. One of the objectives of the service uncovered in the preliminary study was for the students to be happy in their current school life. This does seem to be so in the majority of cases.

The RTV assessment of motivation rated 84 percent of the students as motivated or highly motivated. My visits to the students confirmed this opinion.

Chapter 8: Conclusions

> "One of the most important aspects of one's research is…to understand the questions that it does *not* answer." (Ulrich, 2001 p. 6)

This chapter draws together the aims, results and developments of the research. It begins with a reminder of the purpose of the research and the process involved. The results and the process are commented on and critiqued, and the contributions of the research explained. The implications of the process and results of the research for policy decisions are outlined. In some respects, the research raises more questions than it answers. Some of the ethical dilemmas that have arisen will be discussed. Finally, the avenues for further research are listed, followed by a summary of the contributions this research makes, and the communities of interest.

8.1 Summary of the research

Existing case-load guidelines for the education of learners with vision impairment within New Zealand, and internationally, are not based on empirical research. The motivation for this research was to develop a way to clarify the relationship between the inputs and outcomes of educational endeavours for learners with vision impairment, with the aim of informing caseload policy. Chapter 1 contains a full explanation of the initial problem situation.

Before embarking on quantitative data collection, a preliminary qualitative study was undertaken in order to inform the research process. The main outcomes of the preliminary study were the identification of the purposes of the service predominantly provided by RTVs, a potential outcome measure, and many potential indicators of need. This was reported in Chapter 2.

The preliminary study gave rise to the idea of measuring opportunity-to-learn and this was explored in the research literature, as reported in Chapter 3. It was proposed that the students could be asked about their perceptions, and an instrument, the Essential Skills Access test (ESA) was developed, based on the Essential Skills of the New Zealand Curriculum, to measure the access that students have to the

curriculum, and in particular the development of skills. The development of this instrument was described in Chapter 4. The ESA test was piloted and then trialled on a baseline sample of 1300 students from twenty diverse schools in three regions of New Zealand. The analysis of this data suggested that student perceptions could be used to indicate differences between schools, and between boys and girls, with respect to opportunity-to-learn skills. The mechanics of the research and the results were reported in Chapter 5.

The focus of the research then returned to the original population of interest, the learners with vision impairment, and in particular those in the first three years of secondary school. Fifty students with vision impairment were surveyed using the instrument, which had been adapted into formats accessible for this population. In addition, data was collected from the school, mainstream teachers, RTV and parents of each of the students regarding service provision and the level of need. The process involved was set forth in Chapter 6, and in Chapter 7, the results of the analysis were reported.

8.2 Commentary

The use of a combination of qualitative and quantitative methods is well supported by the literature of Educational Evaluation and of Operational Research. In this endeavour, the initial qualitative research was pivotal to providing a strong underpinning for the later research. It also encouraged the participation of stakeholders in the process, and helped to provide a context for the results of the quantitative data analysis. There was considerable feedback between the two approaches. The quantitative results were examined to find where they supported the results of the qualitative study. In many cases they did not, and the tension revealed the very individual nature of the students and the decisions made about service provision. The issue that the decisions were so individual was a theme to come through the qualitative study. This individuality is one of the reasons that quantitative modelling, aiming to build a general model, was only marginally successful. The results of the qualitative study were also used to explain some of the findings of the quantitative analysis.

Another theme to emerge from the qualitative study was the tension between the ideal and the realistic levels of provision. The numerical data on needed and provided service provision supplied evidence of the different views of ideal and realistic service levels. In the qualitative study it was suggested that for about half of the IEPs a parent was not present. This did not prove to be the case for this sample.

Several of the original research questions have been answered only generally by this research. In some respects it could be said that the research identified that they were the wrong questions. For example, research question 3, on page 23, asks what are the desired outcomes for a particular category of learner with vision impairment. This question assumes a more specific set of categories than was available. In hindsight, the individual nature of all students, including those with vision impairment, precludes the use of specific academic outcomes such as passing a certain level of qualification. An answer from this research is that the desired outcome for all students is for them to have the opportunity-to-learn to prepare themselves for future life as happy, contributing citizens. When this outcome definition is used, there is no need for categorisation with regard to outcome.

The development of the idea to measure student perceptions, and the ESA test, are the main contributions of this research. The idea of using student perceptions to evaluate educational programmes at school level is in its infancy. The results gained during this study showed that there is definite value in asking the students, particularly if the results are used in aggregated form. Whether the instrument is relevant for measuring individual student need is still unclear. As the specific population of interest, learners with vision impairment in years 9 to 11, was so diverse, and there were

so many variables, it was difficult to evaluate how valid the instrument was. As was pointed out in the preliminary investigation, a student's view, and consequently the ESA scores, could differ from day to day, depending on a variety of environmental and personal reasons. However the effect of aggregating the pupil scores is to reduce the variation, and the aggregated scores appear more reliable.

The analysis of the baseline sample gave some interesting results, along with testing the validity of the approach and the instrument. Different schools scored differently in mean ESA scores, and differences between the responses of boys and girls, and between students at different year levels were identified. Using student perceptions as a process indicator opens up a variety of further avenues for research.

The question remains, however whether the instrument is valid, for measuring the effectiveness of education for learners with vision impairment. Though it is not an ideal measurement, there are few alternatives. As discussed in Chapter 3, examination results have limited use, and for two thirds of this population (Years 9 and 10) there were no common examination results available. In the long-term, a measure of later quality of life might be useful, but would involve waiting several years; this too has its obvious limitations. In the absence of any appealing alternative, it seemed a worthwhile endeavour to develop a measure of opportunity-to-learn. The results suggest that this measure provides some information. Further research of a longitudinal nature could explore the relationship between opportunity-to-learn, academic results and long term quality-of-life outcomes.

The ESA test, along with the other data collection, provided a comprehensive view of the state of education for learners with vision impairment in Years 9 to 11 in New Zealand. This in itself is a contribution to the field of vision impairment and blindness, and to the development of policy and practice in the new BLENNZ. Generally the provision of services for the education of this group of learners with vision impairment appears to be satisfactory, and results in a level of opportunity-to-learn at least as good on average as for similar students with no identified special needs. Students with vision impairment in years 9 to 11 tend to like school and are happy with what is happening there for them. Two aspects give rise to questions. The first concern is whether these students have the information to be able to make judgments about what opportunities they are receiving. Do they have lower expectations than the other students and are thus more easily pleased? The second concern is whether school is such an important and positive part of their life that their responses are inflated by a halo effect.

8.3 Policy Implications

As a result of the insights gained through the process of this research, the following recommendations and observations will be made to the Board and Principal of BLENNZ (Blind and Low Vision Education Network (NZ)):

An area of the regular curriculum that may be neglected for the students with vision impairment, and particularly for the blind students is Physical Education. Students in Years 9 and 10 are possibly being encouraged out of Physical Education. It might be worthwhile to make a particular point in IEP meetings to explore what is happening in Physical Education, and if necessary look at ways of improving matters, possibly through providing training to mainstream Physical Education teachers, immersion courses to develop fitness among these students, and the encouragement of sports such as Blind Cricket, Blind Soccer, Goal-ball and Rock-climbing, that are particularly suited to learners with vision impairment.

Mainstream teachers indicated that they would like more training if they have a student with a vision impairment in their class. This might be achieved through day-long courses, distance material or one-on-one help from RTVs or other specialist teachers.

The area of technology is particularly important to learners with vision impairment. As a side observation it was noticed that some students have limited opportunities to learn to use equipment such as a Braille-note to full advantage. One way to address this might be through the appointment of a technology specialist for New Zealand, or through immersion courses. (As this was being written, such a course was in the planning stages, based at Humanware, the manufacturers of the Braille-note.)

The group of students who seemed least well served and to have poorest opportunity-to-learn was those who are not verified as having High Needs(II) or Very High Needs.(III) These students with Moderate Needs(I) are not provided for by central funding allocation and seem to be missing out on needed assistance. In some cases the teachers were unaware that there was a student with vision impairment in their class. The SE2000 categorisation is such that there will be students at the top end of the Moderate Needs category with similar levels of need as those at the bottom end of the High Needs category. However the levels of service did not seem continuous over the break between these two categories. It would appear that there are students with Moderate Needs who could benefit from greater intervention, perhaps one or two hours teacher aide assistance per week (funded out of the school's Special Education Grant), more frequent visits from the RTV, or more training for their

mainstream teacher(s). Perhaps the instigation of the IEP process for all students on the BLENNZ roll (annually for those at the lower end of the scale in terms of need) would help to address this concern.

There is much variety within the population with respect to level of need, cost etc. Calculating staffing requirements using a formula based on numbers alone is unlikely to give good results. In many geographical areas there is little opportunity for economies of scale – the addition of one braille-user to the roll can increase the workload by 20%, which is difficult to absorb in a sole-teacher centre. Ways of dealing with this while still following practices of a good employer could be explored. One possibility for some centres is the moving of boundaries between some adjacent centres (such as Gisborne and Hawkes Bay, for instance) in order to balance load.

The RTVs' assessments of unmet need may be more indicative of the attitudes of the teachers to their role, than of the level of service being provided. This may be a result of many years of having to cope with unmanageable workloads in some centres, which has led to a changed perspective of the role of the RTV. As RTVs become accustomed to being in an advisory role because of time constraints, their expectations of service need decrease. There was clearly a difference in the level of service provided to students with similar levels of need in different parts of the country. It suggests that BLENNZ may need to clarify the role of the RTV for different types of student, and perhaps audit the practices in various centres, to encourage equity of provision throughout New Zealand.

8.4 Ethical Questions

Throughout the course of the research, various ethical questions have surfaced about the use of funds to provide education. The results could be interpreted to mean that learners with vision impairment have better opportunity-to-learn than their sighted peers. This provokes the ethical question of whether it is satisfactory for learners with vision impairment to receive greater perceived opportunity-to-learn than the general population. Some may suggest that education is more necessary for learners with vision impairment as their life choices are more limited if they are not well educated, and thus the higher level of opportunity-to-learn is necessary and justified. If not, then an aim might be to explore what can be done to improve the level of opportunity-to-learn for the regular population, drawing on the experience of the learners with vision impairment.

Similarly, it is debatable whether the Government is obligated to provide services to teach the Expanded Core Curriculum to learners with vision impairment in addition to the regular curriculum. Much of the Expanded Core Curriculum is contained within the regular curriculum, but not all of it. There are elements of the curriculum that need to be taught specifically to learners with vision impairment, that are simply absorbed by sighted children. Examples of these are the specific teaching of playground social skills or road crossing. Is this the responsibility of the Ministry of Education?

There is an underlying tension between the views of the RTVs who aim to provide an *ideal* level of education for these students in the face of limited resources, and the realist's approach that says that fair and efficient is all we can ask for. It seems unlikely that many students in New Zealand receive an "ideal" education. Aiming for ideal provision in the education of learners with vision impairment is a laudable sentiment, but leads to anxiety among parents and RTVs that many of the students should be receiving more. The Key Objectives of Special Education 2000 were cited in Chapter 1 of this thesis, and included to "provide equitable resourcing for those with similar needs irrespective of school setting or geographic location" (Ministry of Education, 2005b). The principle is equity rather than idealism.

One of the Ministry's key principles is "All special education resources are used in the most effective and efficient way possible, taking into account parent choice and the needs of the young child or student." (Ministry of Education, 2005b). This begs the question, of how much choice parents are entitled to when deciding on the schooling options for their child with special educational needs? One of the problems in educating students with special needs in mainstream settings is the lack of economies of scale. At present parents can insist that their child attend their local school, and the

government is obliged to provide services and facilities for them. It is possible that better opportunity-to-learn could be provided for the same level of funding by designating certain schools to provide services to particular students with special needs. This is an example of where the practical solution may not be the palatable solution if parents prefer to send their child to their local school.

8.5 Further Research

This research is a starting point for further research in Educational Effectiveness studies related to the general population and aspects of education for learners with vision impairment or other special needs. Other research ideas listed below arose during the course of the research but do not necessarily lead on directly from this work. The main directions for future research are grouped into those related to the ESA test and the Attrition of the Intended Curriculum and those related to the provision of educational services to learners with vision impairment.

The instrument, the ESA test, was found to be effective in aggregated form in indicating differences between schools and between boys and girls. A wide range of ways in which the instrument can be developed and used in further research was explained in Section 5.8. These included:

- Further refinement of the ESA test resulting in a reduced number of indices. These may relate to the intended "Competencies" being developed by the Ministry of Education to replace the Essential Skills, on which the ESA was based.
- Trialling the use of the ESA test in younger age groups.
- Longitudinal studies looking at the effects of opportunity-to-learn, using the ESA test.
- Cross-sectional studies, particularly of perceived opportunity-to-learn at a wider range of schools, followed up with exploration of what makes some schools "more equal" in their opportunity-to-learn for boys and girls.
- Studies using the ESA test to explore what influences opportunity-to-learn, including student, teacher, class and school characteristics.
- Comparison of perceptions of opportunity-to-learn between teachers, pupils and parents.

The conceptual framework of the Attrition of the Intended Curriculum has potential to inform research, practice and discussion in Education.

The results of the study on learners with vision impairment indicated other areas where research has the potential to inform practice. Some of this could use the ESA test as an outcome measure. The following areas of need for research were identified, some of which could make use of Operational Research methods:

- A comprehensive costing of the services provided for learners with vision impairment.

- A staff planning model for BLENNZ, including generating projections of future demand. This could be developed as a simulation, exploring various scenarios and the possible strategies to meet projected need. In particular this would be cognisant of the discontinuities and lack of economies of scale due to the low incidence and heterogeneity of the population of learners with vision impairment.

- A study of the teaching of the expanded core curriculum, particularly focussing on how much of this is being taught by RTVs, as opposed to their mainly enabling their students to participate with the regular classes.

- Research into the level of provision of Physical Education for learners with vision impairment in New Zealand and the effects on long term health and well-being. This could include action-based research to initiate improved provision in mainstream settings.

8.6 Contributions

This research has covered several fields of study and there are several areas of contribution. These are listed here, with an indication of the community of interest.

- Measuring educational opportunity as perceived by students - a process indicator. (submitted in May 2005 to “School Effectiveness and School Improvement”)
- The different opportunity-to-learn scores for boys and girls. (refereed paper delivered at the New Zealand Association for Research in Education conference, December 2005)
- The purpose of provision to learners with vision impairment. (Vision impairment and blindness)
- The efficacy of measuring opportunity-to-learn to evaluate the education of learners with vision impairment. (Vision impairment and blindness, or a more generic special needs)
- An analysis of the strengths and weaknesses of vision education in New Zealand for years 9 to 11. (Service provider - BLENNZ)
- The potential use of Operational Research in Special Education. (Operational Research)
- The conceptual framework of the Attrition of the Curriculum. (Educational Research).

8.7 The Last Word

The initial aim of the research was to use quantitative data to inform caseload guidelines. The preliminary study revealed the absence of measurable outcomes in Special Education, which led to the proposal to measure opportunity-to-learn from the students' perception in order to provide information regarding the adequacy of provision. The ESA test and the underlying conceptual framework are resulting contributions to research methods in Educational Effectiveness and in Special Education. Testing on a medium to large sample of students in regular education displayed the instrument's potential to provide worthwhile and timely information to principals, researchers and service providers regarding educational provision.

The strength of the ESA test appears to lie in measuring groups of students and aggregating the results. The heterogeneity and small size of the vision impaired population inhibited the development of the desired explanatory models. Nevertheless, the use of the ESA test on learners with vision impairment, combined with the other extensive data was able to provide worthwhile information to guide policy and administrative decisions in vision education.

Operational Research thinking centres around building models of systems in order to understand and improve decision-making. There are many areas within education that can benefit from the use of this paradigm. In particular, the area of Special Education requires high levels of resourcing, and because the population is so heterogeneous, there are many issues related to the effective use of funds. This research has identified some more questions that need answering, and ways to approach the questions, as well as some answers.

In particular, this research has shown that it is valid to use student perceptions to evaluate the education of high school students with and without vision impairment.

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Appendices

Appendix 1: Explanation of the Decile system

Background information on decile rating

All state-funded schools in New Zealand are assigned an index related to the socio-economic status of their pupils. The Targeted Funding for Educational Achievement (TFEA) is a form of supplementary funding, delivered to New Zealand schools according to this socio-economic indicator, known as the decile rating. The Special Education Grant (SEG) and the Careers Information Grant (CIG) are also allocated, per capita, according to the decile rating of the school. The total per capita amounts in 2002 for the TFEA, SEG and CIG were $419.36, for decile 1A schools (schools of most disadvantage) and $35.35 for decile 10 schools (schools of least disadvantage). The aim of the targeted funding is to recognise and compensate for the extra demands on schools due to the presence of a large number of pupils of social disadvantage.

The decile rating used in 2002 divided all New Zealand schools into 10 groups of about 260 schools each, according to the score in an indicator comprising measures of

- equivalent household income,
- average number of persons per bedroom,
- parents without any educational (including school) qualifications,
- parents receiving income support,
- parents in lowest Census occupational groups,
- Maori and Pacific Islands students as a proportion of total school roll. ((Ministry of Education, 2002))

The information on each of these measures. except for the ethnicity measure, is taken from the census meshblocks around the addresses of all or a sample of the pupils in the school. Note that the index indicates what proportion of the students on the school roll is assessed to be socio-economically **disadvantaged**. The index is not a measure of wealth or of social advantage of the school population as a whole, though it is popularly used as an indicator of socio-economic status. A high decile school will often, but not always, be associated with a high socio-economic area.

Socio-economic status is an important influence on educational achievement, which may or may not be related to educational opportunity. It was important for this reason to include schools from a range of deciles in the sample, and relevant to think about where the most variation in socio-economic status is likely to be. It was hypothesised that there would be the most variation between schools within deciles in the extreme ends, the decile 1 and 10 schools. There could be the most variation between pupils in some of the middle decile schools, which could draw on a wide range of socio-economic background. The variation between adjacent deciles will be least in the middle decile schools, assuming a moderately normal distribution. As it turns out, there is a wide variation in all the deciles. For example, school four was a decile 9, as it is situated in an area of low unemployment in a service town in the South Island. However it has difficulties finding suitable trustees as there are few parents with professional backgrounds.

There are several ways that school decile rating could be included in models, depending on whether or not the relationship between the decile and the dependent variable is assumed to be linear. If the effect is linear, then it is valid to use the decile value as it stands. However if the effect is not linear, then the decile rating should be treated as categorical, with one variable for each decile. For a small sample it is not acceptable to have ten categorical variables, so it is necessary to group the decile values together. Chamberlain & Walker (2001) grouped the deciles into three decile bands, Low (1 – 3), Medium (4 - 7) and High (8-10) when reporting on the New Zealand results from TIMMSS. This grouping is also used in other research into participation in Tertiary Education (Hughes & Pearce, 2003). Some research has used Low (1 -3) compared with higher decile. Several coding schemes were used in this research.

The average school size differs greatly between the different decile groups. This results in an uneven spread of pupils in the decile groups, particularly for secondary schools. Figure 25 shows the approximate numbers of pupils in each of the decile groups for 1st July 2001.

Figure 25 shows that the number of pupils in each of the deciles is far from equal. There are nearly four times as many pupils in Decile 10 schools (fewest disadvantaged pupils) as there are in Decile 1

schools (highest number of disadvantaged pupils.) The same effect is evident in the total population of pupils, though not to such a marked extent as for secondary pupils.

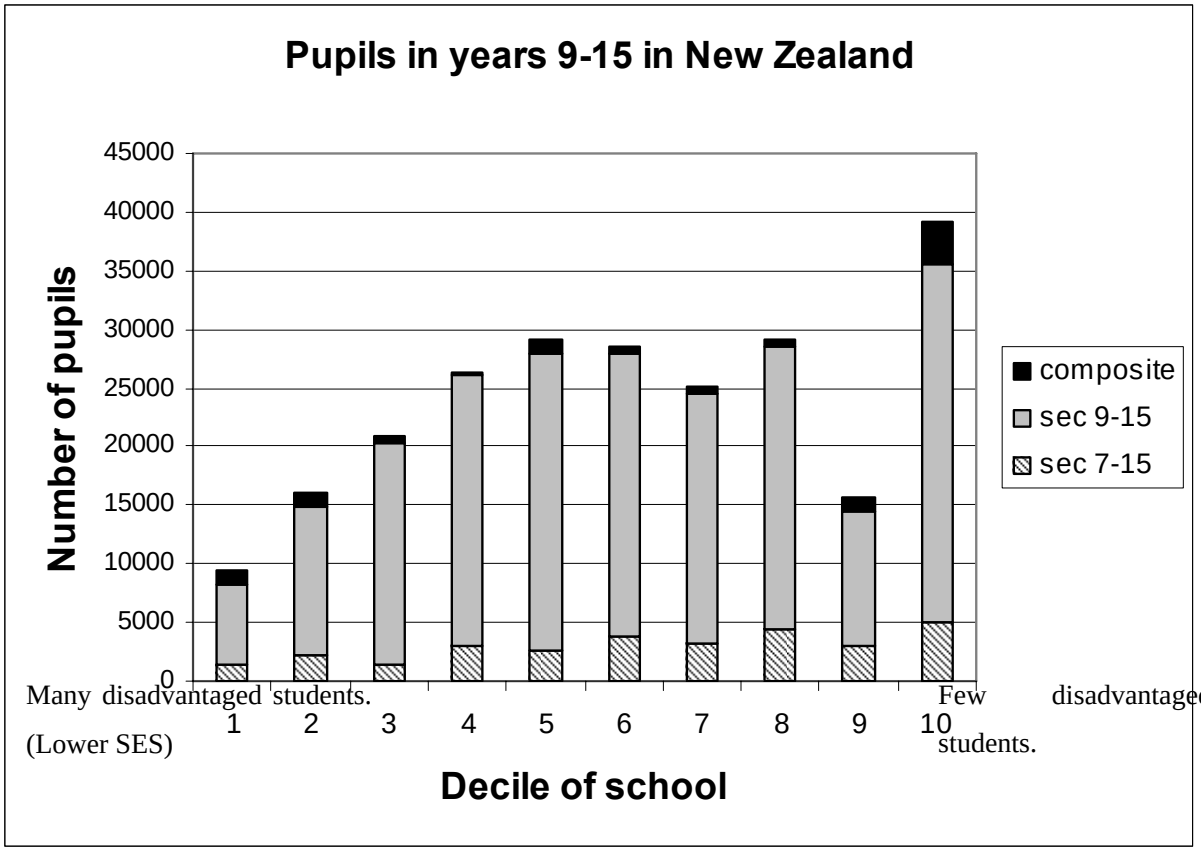

Figure 25. Distribution of pupils in secondary schools in New Zealand

Appendix 2: Statement of Bias

The following statement was written on Friday, 11 December 1998 by Nicola Petty. It is a candid statement of my beliefs at the time.

I believe:

Children who have disabilities have a right to the education that will help them function as best they can. There is not an unlimited supply of money, so there is a responsibility to use it as effectively as possible to help all children. I am unsure of how I would allocate scarce resources between a severely impaired child and one who needs a little help to function “normally”. Sometimes it seems a waste of money when lots of money is used for a very impaired child, and some children who need a little help go without. I see money spent on O&M as an investment in the future as it will help blind adults to be independent and not reliant on benefits. The government should fund the provision of necessary services for learners with vision impairment.

Parents have a right to be involved in the education decisions regarding their child. Many families with children with special needs are under severe strain and may need help in making the best decisions for their children. Parents are allowed to make less than optimal decisions for their children. I tend to think about what happens in the parenting of an ordinary child. Parents often make bad choices regarding their ordinary children. However the government is not required to fund extreme choices by parents, nor should satisfying the rights of the child with the disability impinge on the rights of other children in a class or school.

The decision making process concerning resources for learners with vision impairment should be explicit.

Services for children with vision impairment are best provided by people who have training in services for children with vision impairment. Where there are multiple disabilities providing a serious impact on the child, it would be ideal to have a specialist with expertise in the combination of disabilities (eg deaf/blind, or blind/autistic.) In the absence of such a specialist, a team approach is needed.

I do not believe it is realistic to expect to provide the same level of service in all geographic locations(eg Auckland vs remote country area). Parents need to be informed of the trade-offs of different locations. However similar locations, such as Wellington and Christchurch, should provide a similar level of service.

Teachers of learners with vision impairment need to be rewarded for their expertise through a fair pay system and career path that acknowledges training and experience. They need to be able to work in a supportive environment.

Teacher aides who work with braille students should be required to know braille, and be paid for their skills.

Learners with vision impairment have historically been under-funded, especially when compared with their equivalent with a hearing impairment. This may or may not be true, but it is definitely my perception. In fact I have been known to say that the level of under-funding is “criminal”, particularly with regard to O & M.

Early childhood education is important.

It is not possible to satisfy totally all the needs of all the children. Even with an unlimited budget, there still need to be trade-offs, even if we knew exactly what a child needed.

I tend to ally myself with the teachers and parents in trying to help the children. I see the Ministry of Education as not helpful, and sometimes obstructive.

Teachers and specialists have the ability to make rational estimations of the amount of time a student needs to succeed. They can do this in a disinterested fashion, without trying to protect their own jobs.

I am not confident that the RNZFB makes the best decisions for learners with vision impairment. I see a level of protectionism and a lack of professionalism in some areas.

I am not happy about aspects of SE2000. The Ongoing Resourcing scheme is a good idea, especially removing the uncertainty of support. I believe it has been under-funded, and I am not sure about its underlying philosophy.

Quantitative methods are often misused. A survey with pseudo-numerical answers is given more weight in some disciplines than carefully done interviews.

Appendix 3: Letter to RTVs for the interviews

Dear RTV,

As you are aware, I am conducting research into the resource needs of learners with vision impairment. The first phase of the research is a qualitative study during which I am interviewing teachers and other stakeholders. Because of your experience working in this field I have arranged to meet with you for an interview. This should take about an hour.

I will not be seeking information about individual learners on your caseload, but rather general principles. However in discussing the general, it may be useful to illustrate with examples from your experience. In the interests of privacy I ask that pseudonyms be used. As a researcher I am committed to protecting the privacy of the individual. Any data will be presented in such a way as to protect the identity of individuals, including yourself. I would like to audiotape our conversation for later transcription and analysis. The tapes will be kept in a locked filing cabinet in my office, transcribed by myself, and the files stored with password protection.

As arranged earlier I will be at the Visual Resource Centre for an interview at 1.30pm on Thursday 11th November.

I appreciate that you are very busy in your work. However I believe this research will be valuable in improving conditions for learners and teachers in the area of vision impairment. Thank you for your co-operation.

I look forward to seeing and talking with you.

Yours faithfully

Nicola Petty

Appendix 4: Questions for interviews

Introduction

Thank you for your help in this research. My aim is to draw on your experience and knowledge and combine that with what I hear from other teachers, to build up a comprehensive picture of resource provision for learners with vision impairment.

Do you have any questions you'd like to ask me?

Determinants of need

I thought we could start by looking at how you decide the level of services a child needs.

You have several different children on you caseload, and have worked with different children over the years. When you decide or recommend the level of service and resources, what do you need to know?

Might the same child need different levels of service at different times or stages? At what times would they need more?

What factors do you think are the most important/ have the most impact? The least important? Why does one child do better than another?

Categories

At present SE2000 uses three groupings, Very High Needs, High Needs and Moderate Needs. How well do these categories work?

How would you group the learners with vision impairment?

Have a think about your current caseload. Would any of those get a pretty similar service?
Why?
Is this what they need?
What drives this?

Would there be children who just did not fit in any category? How many would there be?

Outcomes

If we look at resource provision – itinerant teacher, teacher's aide etc as one package, what do you see as the purpose of all this for the children?

Some people might see the level of resource provision for these children as very expensive. How would you respond to that?

What are you trying to accomplish with the children you work with?

How do you know if you have achieved it?

Who would you see as the "customer"?

How might you measure "customer satisfaction"?

Who guides the expectations for the individual learner with vision impairment?

What does the term outcome means to you?

I would like to identify some measurable outcomes for use in my research. Can you suggest any?
Probes:
PAT tests, standardised tests?

How does a child with vision impairment get access to the New Zealand curriculum ?

What are your thoughts on estimating how much access a child has to the New Zealand Curriculum?

To the expanded core curriculum?

Would you be able to estimate the level of access your children have to specified aspects of the New Zealand Curriculum? How about the access they should be able to have? Can you think of ways to do this?

Current Provision

I'd like you to think about the children with whom you work, or who are on your caseload. How many are there altogether?
Now think about the level of resource provision they get, including VRT, teacher's-aide, and materials production, but not including O&M.
How many of them would be getting pretty much all the resources they need?

Are there any getting no extra input at all?

Describe briefly the ones in each group. Eg Multi-impaired, blind normal etc.

Which of the children are getting O& M? Enough?

Priorities

How do you decide how much of your own time you give to each child?

Within the Visual Centre, how is it decided?

How do you feel about making that decision?

How much do you think your own biases affect the decision if at all?

Do you have anything else you would like to add or ask?

Thank you.

Appendix 5: Coding from the preliminary study

```
(1)                 /Determ
(1 1)               /Determ/Support
(1 1 1)             /Determ/Support/Sup Family
(1 1 1 15)          /Determ/Support/Sup Family/Parent
(1 1 2)             /Determ/Support/Setting
(1 1 2 9)           /Determ/Support/Setting/Decile
(1 1 2 11)          /Determ/Support/Setting/ms teacher
(1 1 2 19)          /Determ/Support/Setting/Class size
(1 1 3)             /Determ/Support/T Aide
(1 1 3 1)           /Determ/Support/T Aide/Quality
(1 1 3 2)           /Determ/Support/T Aide/Duration
(1 1 4)             /Determ/Support/0.2 teacher
(1 2)               /Determ/Temporary
(1 2 1)             /Determ/Temporary/Onset
(1 2 3)             /Determ/Temporary/Transition
(1 2 3 1)           /Determ/Temporary/Transition/Natural
(1 2 3 2)           /Determ/Temporary/Transition/Extra
(1 2 4)             /Determ/Temporary/Stage
(1 2 8)             /Determ/Temporary/Changing
(1 2 16)            /Determ/Temporary/Functioning
(1 2 17)            /Determ/Temporary/Previous
(1 2 20)            /Determ/Temporary/spec progs
(1 6)               /Determ/Child
(1 6 1)             /Determ/Child/Intelligence
(1 6 2)             /Determ/Child/Individuality
(1 6 3)             /Determ/Child/Security
(1 6 4)             /Determ/Child/Vision
(1 6 4 1)           /Determ/Child/Vision/Vis Change
(1 6 4 5)           /Determ/Child/Vision/Braille
(1 6 10)            /Determ/Child/Maori
(1 6 12)            /Determ/Child/physical
(1 6 13)            /Determ/Child/NZ_Curr
(1 6 14)            /Determ/Child/Other Dis
(1 7)               /Determ/Geography
(1 18)              /Determ/Interact
(2)                 /Categories
(2 1)               /Categories/SE2000
(2 1 1)             /Categories/SE2000/Verification
(2 2)               /Categories/Current Cats
(2 2 1)             /Categories/Current Cats/Freqvisit
(2 2 2)             /Categories/Current Cats/Flaws
(2 3)               /Categories/movecats
(2 4)               /Categories/Attitudes
(2 5)               /Categories/Flexibility
(3)                 /Purpose
(3 1)               /Purpose/Motivation
(3 1 1)             /Purpose/Motivation/Equal Opp
(3 1 4)             /Purpose/Motivation/Economic
(3 4)               /Purpose/Proc and future
(3 4 2)             /Purpose/Proc and future/Independence
(3 4 5)             /Purpose/Proc and future/happy
(3 4 13)            /Purpose/Proc and future/Social
(3 4 15)            /Purpose/Proc and future/potential
(3 17)              /Purpose/Process
(3 17 7)            /Purpose/Process/Skills
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(3 17 9)              /Purpose/Process/Concepts
(3 17 10)             /Purpose/Process/NZ Curr
(3 17 11)             /Purpose/Process/Academic
(3 17 16)             /Purpose/Process/Choice
(3 18)                /Purpose/Future
(3 18 3)              /Purpose/Future/Fulfilment
(3 18 6)              /Purpose/Future/community
(3 18 8)              /Purpose/Future/Tertiary
(3 18 12)             /Purpose/Future/Contribute
(3 18 14)             /Purpose/Future/Employment
(4)                   /Service
(4 1)                 /Service/Role VRT
(4 1 1)               /Service/Role VRT/Issues
(4 1 1 1)             /Service/Role VRT/Issues/Range of Need
(4 1 1 5)             /Service/Role VRT/Issues/Workload
(4 1 1 7)             /Service/Role VRT/Issues/Focus on vision
(4 1 1 13)            /Service/Role VRT/Issues/Stresses
(4 1 1 14)            /Service/Role VRT/Issues/Priorities
(4 1 1 15)            /Service/Role VRT/Issues/Flexible
(4 1 2)               /Service/Role VRT/Activities
(4 1 2 1)             /Service/Role VRT/Activities/Vocation
(4 1 2 2)             /Service/Role VRT/Activities/Support team
(4 1 2 3)             /Service/Role VRT/Activities/hands on
(4 1 2 4)             /Service/Role VRT/Activities/Transcribe
(4 1 2 6)             /Service/Role VRT/Activities/Lobbying
(4 1 2 8)             /Service/Role VRT/Activities/Refer
(4 1 2 9)             /Service/Role VRT/Activities/RepsAss
(4 1 2 10)            /Service/Role VRT/Activities/Equipment
(4 1 2 11)            /Service/Role VRT/Activities/Caseworker
(4 1 2 12)            /Service/Role VRT/Activities/enrol
(4 1 2 16)            /Service/Role VRT/Activities/vision use
(4 1 2 17)            /Service/Role VRT/Activities/Adapt test
(4 1 2 18)            /Service/Role VRT/Activities/travel
(4 2)                 /Service/Feedback
(4 3)                 /Service/teacher
(4 4)                 /Service/O and M
(4 5)                 /Service/Materials
(4 6)                 /Service/Enough
(4 7)                 /Service/Equip
(5)                   /Outcomes
(5 1)                 /Outcomes/IEP
(5 2)                 /Outcomes/progress
(5 3)                 /Outcomes/school
(5 4)                 /Outcomes/Assess
(5 5)                 /Outcomes/Social
(6)                   /customer
(6 1)                 /customer/satisfaction
(6 2)                 /customer/survey
(6 3)                 /customer/parents assess
(7)                   /NZ_Curr
(7 1)                 /NZ_Curr/resources
(7 2)                 /NZ_Curr/Possible
(7 3)                 /NZ_Curr/Measure
(7 3 1)               /NZ_Curr/Measure/student
(7 4)                 /NZ_Curr/ECC
(8)                   /IEPs
(8 1)                 /IEPs/who has
(8 2)                 /IEPs/Attends
(8 3)                 /IEPs/Runs
```

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(9)                     /Process
(D)                     //Document Annotations
(F)                     //Free Nodes
(F 1)                   //Free Nodes/Camps
(F 2)                   //Free Nodes/enrolment
(F 3)                   //Free Nodes/Pay for ta
(F 4)                   //Free Nodes/Peers
(F 5)                   //Free Nodes/Value to ms
(F 6)                   //Free Nodes/Vulnerable
(F 7)                   //Free Nodes/Resistance
(F 8)                   //Free Nodes/Individual
(F 9)                   //Free Nodes/Too much
(F 10)                  //Free Nodes/Expectations
(F 11)                  //Free Nodes/Bias
(F 12)                  //Free Nodes/T peers
(F 13)                  //Free Nodes/question
(F 14)                  //Free Nodes/eligibility
(F 15)                  //Free Nodes/No Service
```

Appendix 6: The Essential Skills of the New Zealand curriculum

Communication Skills

C1. communicate competently and confidently by listening, speaking, reading, and writing, and by using other forms of communication where appropriate

C2. convey and receive information, instruction, ideas, and feelings appropriately and effectively in a range of different cultural, language, and social contexts.

C3. develop skills of discrimination and critical analysis in relation to the media and to aural and visual messages from other sources

C4. argue a case clearly, logically and convincingly

C5. become competent in using new information and communication technologies, including augmented communication for people with disabilities.

Numeracy Skills

N1. calculate accurately

N2. estimate proficiently and with confidence

N3. use calculators and a range of measuring instruments confidently and competently

N4. recognise, understand, analyse, and respond to information that is presented in mathematical ways, for example, in graphs, tables, charts, or percentages

N5. organise information to support logic and reasoning

N6. recognise and use numerical patterns and relationships

Information Skills

IN1. identify, locate, gather, store, retrieve, and process information from a range of sources

IN2. organise, analyse, synthesize, evaluate, and use information

IN3. present information clearly, logically, concisely, and accurately

IN4. identify, describe, and interpret different points of view and distinguish fact from opinion

IN5. use a range of information-retrieval and information-processing technologies confidently and competently

Problem-solving Skills

PS1. think critically, creatively, reflectively, and logically

PS2. exercise imagination, initiative, and flexibility

PS3. identify, describe, and redefine a problem

PS4. analyse problems from a variety of different perspectives

PS5. make connections and establish relationships

PS6. inquire and research, and explore, generate and develop ideas

PS7. design and make

PS8. test ideas and solutions, and make decisions on the basis of experience and supporting evidence

PS9. evaluate processes and solutions

Self-management and Competitive Skills

SM1. set, evaluate, and achieve realistic personal goals

SM2. manage time effectively

SM3. show initiative, commitment, perseverance, courage and enterprise

SM4. adapt to new ideas, technologies, and situations

SM5. develop constructive approaches to challenge and change, stress and conflict, competition, and success and failure

SM6. develop the skills of self-appraisal and self-advocacy

SM7. achieve self-discipline and take responsibility for their own actions and decisions

SM8. develop self-esteem and personal integrity

SM9. take increasing responsibility for their own health and safety, including the development of skills for protecting the body from harm and abuse

SM10. develop a range of practical life skills, such as parenting, budgeting, consumer, transport, and household maintenance skills

Social and Co-operative Skills

SC1. develop good relationships with others, and work in co-operative ways to achieve common goals

SC2. take responsibility as a member of a group for jointly decided actions and decisions

SC3. participate appropriately in a range of social and cultural settings

SC4. learn to recognise, analyse, and respond appropriately to discriminatory practices and behaviours

SC5. acknowledge individual differences and demonstrate respect for the rights of all people

SC6. demonstrate consideration for others through qualities such as integrity, reliability, trustworthiness, caring or compassion (aroha), fairness, diligence, tolerance (rangimarie), and hospitality or generosity (manaakitanga)

SC7. develop a sense of responsibility for the well-being of others and for the environment

SC8. participate effectively as responsible citizens in a democratic society

SC9. develop the ability to negotiate and reach consensus.

Physical Skills

PH1. develop personal fitness and health through regular exercise, good hygiene, and healthy diet

PH2. develop locomotor, non-locomotor, and manipulative skills

PH3. develop basic first aid skills

PH4. develop specialised skills related to sporting, recreational, and cultural activities

PH5. learn to use tools and materials efficiently and safely

PH6. develop relaxation skills

Work and Study Skills

WS1. work effectively, both independently and in groups

WS2. build on their own learning experiences, cultural backgrounds, and preferred learning styles

WS3. develop sound work habits

WS4. take increasing responsibility for their own learning and work

WS5. develop the desire and skills to continue learning throughout life

WS6. make career choices on the basis of realistic information and self-appraisal.

Appendix 7: ESA test

E S A

Essential Skills Access Test

This test measures the opportunities you have to learn the Essential Skills of the New Zealand curriculum. The results will be used to provide a comparison for students in other schools and students with special needs.

There are no right or wrong answers, but it is important that you think carefully about each of your answers. If you would like an explanation of any of the questions, please ask.

The statements apply to your experiences in school this year. For each statement circle the number which best describes you or your circumstances.

Section 1: How often?

For these statements think about **how often** these things happen. You can choose from Every day, Most days, Sometimes, Almost never, and Never.

		Every day	Most days	Some-times	Almost never	Never
1	I use a calculator in my work at school.	1	2	3	4	5
2	I participate in exercise programmes or physical education with the class.	1	2	3	4	5
3	I take part in school sporting activities outside of class time.	1	2	3	4	5
4	The work at school is too hard for me.	1	2	3	4	5
5	I work on my own, without help from others.	1	2	3	4	5
6	I read independently.	1	2	3	4	5
7	I use computers to find out information.	1	2	3	4	5
8	I use numbers in my schoolwork.	1	2	3	4	5
9	The work at school is too easy for me.	1	2	3	4	5

Section 2: Always, Usually…?

These statements are also about **how often** these things happen. This time you choose from Always, Usually, Sometimes, and Never.

		Always	Usually	Some-times	Never
10	I feel safe at school.	1	2	3	4
11	I estimate to get a rough answer before using a calculator.	1	2	3	4
12	It is important to hand in my schoolwork on time.	1	2	3	4
13	Things are explained to me in a way I can understand.	1	2	3	4
14	I have enough time to complete my homework.	1	2	3	4
15	School is a good place to be.	1	2	3	4
16	Before I use tools or science equipment I am shown how to be safe with them.	1	2	3	4
17	My teachers have time to help me.	1	2	3	4
18	When I do maths calculations I get the right answer.	1	2	3	4

Section 3: Often, Sometimes…

For these statements, think again about **how often** these things happen. This time you choose from Often, Sometimes, Almost never and Never.

		Often	Some-times	Almost never	Never
19	I am encouraged to express my opinion.	1	2	3	4
20	I use the resources in the school library or information centre.	1	2	3	4
21	I set goals for my learning.	1	2	3	4
22	Things I learn outside of school time are useful at school.	1	2	3	4
23	The classroom is too hot or too cold for me.	1	2	3	4
24	My schoolwork involves solving problems.	1	2	3	4
25	The textbooks help me to learn.	1	2	3	4
26	I use mathematical skills in subjects other than maths.	1	2	3	4

27	I express my feelings through writing.	1	2	3	4
28	My schoolwork requires me to use my imagination.	1	2	3	4
29	I help to keep the school tidy.	1	2	3	4
30	The noise in the classroom makes it hard for me to learn.	1	2	3	4
31	I look at different solutions to the same problem.	1	2	3	4
32	We use graphs and charts to express information.	1	2	3	4
33	I try out my own ideas.	1	2	3	4
34	I get to practise my listening skills.	1	2	3	4
35	I use the internet for schoolwork.	1	2	3	4
36	I am asked to think about how I can improve my work.	1	2	3	4
37	We interpret information in graphs, charts and tables.	1	2	3	4
38	I work as part of a group.	1	2	3	4
39	I design and/or make things.	1	2	3	4
40	I take part in cultural activities such as concerts, school social events, kapa haka etc.	1	2	3	4
41	My schoolwork requires me to think up new ideas.	1	2	3	4
42	I have to decide what is opinion or fact.	1	2	3	4
43	We are encouraged to share our ideas in class.	1	2	3	4
44	I have to look for my own information to complete my schoolwork.	1	2	3	4
45	I get to use measuring, technical or scientific equipment.	1	2	3	4
46	I am encouraged to try new things.	1	2	3	4
47	We view and discuss videos and movies.	1	2	3	4
48	I feel pleased with the work I do at school	1	2	3	4
		Often	Some-times	Almost never	Never

Section 4: How True?

Well done so far. These are a little different. For each statement, think about how true the statement is for you. Is it Very true, Somewhat true, Not very true or Not at all true?

		Very true	Some-what true	Not very true	Not at all true
49	My teachers help me to learn.	1	2	3	4
50	I would do better at school if I could use computers more often.	1	2	3	4
51	At school I am taught to be kind to others	1	2	3	4
52	I am able to take the subjects I want to.	1	2	3	4
53	I am encouraged to try different ways to solve problems.	1	2	3	4
54	I am encouraged to improve my handwriting.	1	2	3	4
55	I am encouraged to improve my keyboard skills.	1	2	3	4
56	My schoolwork is related to my everyday life.	1	2	3	4
57	I find it difficult to learn because of the noise in the classroom.	1	2	3	4
58	School is preparing me to keep learning for my whole life.	1	2	3	4
59	School helps me develop my personal fitness and health.	1	2	3	4
60	I have opportunities to make friends.	1	2	3	4
61	I am encouraged to stand up for my rights at school.	1	2	3	4
62	It is important to present my written work well.	1	2	3	4
63	We read a variety of material, such as newspapers, books, magazines, fiction and non-fiction.	1	2	3	4
64	I would learn better if I were in a smaller class.	1	2	3	4
65	I can find out at school about the careers I'm interested in.	1	2	3	4
66	I learn and develop physical skills at school.	1	2	3	4
67	The others in my class help me to learn.	1	2	3	4
68	I am held responsible for the things I do at school.	1	2	3	4

69	At school I learn ways to work better in a group.	1	2	3	4
70	I am encouraged to set my work out well in maths.	1	2	3	4
71	I can get help at school to know what my strengths are.	1	2	3	4
72	The types of sporting activities at school suit me.	1	2	3	4
73	At school we look after each other.	1	2	3	4
74	I am encouraged to work well.	1	2	3	4
75	I get to use equipment in the classroom as much as the other students in my class.	1	2	3	4
76	The things that happen at school help me to feel good about myself.	1	2	3	4
		Very true	Some-what true	Not very true	Not at all true

		Very true	Some-what true	Not very true	Not at all true
77	The people at my school respect each other.	1	2	3	4
78	My teachers help me too much.	1	2	3	4
79	I use a variety of ways to present information.	1	2	3	4
80	I am encouraged to ask questions.	1	2	3	4
81	My school experiences help me to cope with difficulties in my life outside of school.	1	2	3	4
82	People who can be trusted are valued at my school.	1	2	3	4
83	I will be a better citizen because of things I learn at school.	1	2	3	4
84	At school I learn about healthy eating.	1	2	3	4
85	I can learn relaxation skills at school.	1	2	3	4
86	I am aware of areas where I need to develop or improve.	1	2	3	4
87	I feel excited about learning new things.	1	2	3	4

Section 5

And finally it is useful to know about you.

Year at school (circle one) 9 10 11 12 13

Form Class (e.g. Room 20 or 9Ha) _____

Date of birth _____/_____/_____

Age in years (circle one) 11 12 13 14 15 16 17

Sex (circle one) Boy Girl

School you attend now _____

What language is mainly spoken at home? _____

Do you have a computer at home that you are allowed to use? Yes No

Is there anything about you that makes it difficult for you to learn at school?

Yes No

If you answered Yes to question 96, explain: For example you may have a hearing impairment, or bad asthma._____

Remember that all the information you have given will be kept confidential and private.

Appendix 8: Summary of raw results from the baseline sample

Communication Skills

		Every day	Most days	Sometimes	Almost never	Never
6	I read independently.	43%	27%	19%	8%	3%
		Often	Sometimes	Almost never	Never	
19	I am encouraged to express my opinion.	33%	50%	13%	3%	
27	I express my feelings through writing.	11%	33%	37%	18%	
34	I get to practise my listening skills.	30%	51%	16%	3%	
43	We are encouraged to share our ideas in class.	36%	47%	13%	3%	
47	We view and discuss videos and movies.	20%	53%	23%	4%	
		Very true	Somewhat true	Not very true	Not at all true	
54	I am encouraged to improve my handwriting.	16%	21%	34%	28%	
55	I am encouraged to improve my keyboard skills.	14%	30%	28%	29%	
63	We read a variety of material, such as newspapers, books, magazines, fiction and non-fiction.	28%	45%	21%	6%	
80	I am encouraged to ask questions	26%	47%	23%	4%	

Numeracy Skills

		Every day	Most days	Sometimes	Almost never	Never
1	I use a calculator in my work at school.	12%	31%	48%	8%	2%
8	I use numbers in my schoolwork.	40%	34%	21%	3%	2%
		Always	Usually	Sometimes	Never	
11	I estimate to get a rough answer before using a calculator.	6%	26%	49%	19%	
18	When I do maths calculations I get the right answer.	9%	66%	24%	2%	
		Often	Sometimes	Almost never	Never	
26	I use mathematical skills in subjects other than maths	30%	52%	16%	3%	
32	We use graphs and charts to express information.	24%	56%	16%	3%	
37	We interpret information in graphs, charts and tables.	18%	61%	19%	2%	
45	I get to use measuring, technical or scientific equipment.	37%	49%	13%	1%	
		Very true	Somewhat true	Not very true	Not at all true	
70	I am encouraged to set my work out well in maths.	33%	41%	20%	5%	

Information Skills

		Every day	Most days	Sometimes	Almost never	Never
7	I use computers to find out information.	10%	32%	46%	10%	2%
		Often	Sometimes	Almost never	Never	
20	I use the resources in the school library or information centre.	16%	48%	30%	7%	
25	The textbooks help me to learn.	39%	47%	12%	2%	
35	I use the internet for schoolwork.	39%	36%	18%	7%	
42	I have to decide what is opinion or fact.	12%	58%	27%	3%	
44	I have to look for my own information to complete my schoolwork.	26%	60%	12%	1%	
		Very true	Somewhat true	Not very true	Not at all true	
50	I would do better at school if I could use computers more often.	25%	37%	32%	6%	
62	It is important to present my written work well.	46%	42%	11%	1%	
79	I use a variety of ways to present information.	17%	62%	19%	2%	

Problem-solving Skills

		Often	Sometimes	Almost never	Never
24	My schoolwork involves solving problems.	36%	60%	3%	0%
28	My schoolwork requires me to use my imagination.	14%	59%	22%	5%
31	I look at different solutions to the same problem.	14%	56%	25%	5%
33	I try out my own ideas.	33%	51%	14%	2%
36	I am asked to think about how I can improve my work.	16%	48%	29%	7%
39	I design and/or make things.	33%	35%	28%	4%
41	My schoolwork requires me to think up new ideas.	20%	57%	20%	2%
		Very true	Somewhat true	Not very true	Not at all true
53	I am encouraged to try different ways to solve problems.	16%	60%	21%	2%

Self-management and Competitive Skills

		Every day	Most days	Sometimes	Almost never	Never
4	The work at school is too hard for me.	0%	4%	39%	48%	9%
9	The work at school is too easy for me.	2%	11%	53%	30%	5%
		Often	Sometimes	Almost never	Never	
21	I set goals for my learning.	12%	40%	33%	15%	
46	I am encouraged to try new things.	35%	50%	14%	1%	
48	I feel pleased with the work I do at school	30%	57%	10%	3%	
		Very true	Somewhat true	Not very true	Not at all true	
61	I am encouraged to stand up for my rights at school.	32%	43%	20%	5%	
68	I am held responsible for the things I do at school.	53%	38%	7%	2%	
76	The things that happen at school help me to feel good about myself.	13%	57%	22%	8%	
78	My teachers help me too much.	2%	11%	60%	27%	
81	My school experiences help me to cope with difficulties in my life outside of school.	13%	44%	32%	11%	
87	I feel excited about learning new things.	21%	47%	23%	9%	

Social and Co-operative Skills

		Often	Sometimes	Almost never	Never
29	I help to keep the school tidy.	20%	47%	24%	9%
38	I work as part of a group.	30%	57%	11%	2%
40	I take part in cultural activities such as concerts, school social events, kapa haka etc.	16%	30%	29%	26%
		Very true	Somewhat true	Not very true	Not at all true
51	At school I am taught to be kind to others	37%	42%	17%	3%
60	I have opportunities to make friends.	69%	27%	2%	1%
67	The others in my class help me to learn.	19%	55%	21%	5%
69	At school I learn ways to work better in a group.	25%	54%	17%	3%
73	At school we look after each other.	19%	52%	22%	7%
77	The people at my school respect each other.	7%	59%	27%	6%
82	People who can be trusted are valued at my school.	31%	50%	15%	4%
83	I will be a better citizen because of things I learn at school.	22%	43%	26%	9%

Physical Skills

		Every day	Most days	Sometimes	Almost never	Never
2	I participate in exercise programmes or physical education with the class.	23%	47%	17%	4%	9%
3	I take part in school sporting activities outside of class time.	9%	25%	35%	13%	17%
		Always	Usually	Sometimes	Never	
16	Before I use tools or science equipment I am shown how to be safe with them.	56%	31%	10%	3%	
		Very true	Somew hat true	Not very true	Not at all true	
59	School helps me develop my personal fitness and health.	22%	43%	24%	10%	
66	I learn and develop physical skills at school.	33%	47%	16%	4%	
72	The types of sporting activities at school suit me.	36%	38%	19%	8%	
75	I get to use equipment in the classroom as much as the other students in my class.	45%	43%	10%	2%	
84	At school I learn about healthy eating.	26%	35%	27%	11%	
85	I can learn relaxation skills at school.	8%	28%	40%	25%	

Work and Study Skills

		Every day	Most days	Sometimes	Almost never	Never
5	I work on my own, without help from others.	8%	39%	42%	9%	2%
		Always	Usually	Sometimes	Never	
12	It is important to hand in my schoolwork on time.	50%	32%	16%	2%	
		Often	Someti mes	Almost never	Never	
22	Things I learn outside of school time are useful at school.	30%	53%	15%	3%	
		Very true	Somew hat true	Not very true	Not at all true	
52	I am able to take the subjects I want to.	33%	41%	18%	8%	
56	My schoolwork is related to my everyday life.	16%	39%	34%	12%	
58	School is preparing me to keep learning for my whole life.	33%	48%	16%	4%	
65	I can find out at school about the careers I'm interested in.	43%	40%	13%	4%	
71	I can get help at school to know what my strengths are.	22%	48%	24%	6%	
74	I am encouraged to work well.	41%	45%	12%	2%	
86	I am aware of areas where I need to develop or improve.	36%	49%	13%	2%	

Environment for learning

		Always	Usually	Sometimes	Never
10	I feel safe at school.	42%	50%	6%	2%
13	Things are explained to me in a way I can understand.	9%	62%	27%	3%
14	I have enough time to complete my homework.	16%	48%	30%	6%
15	School is a good place to be.	13%	46%	33%	8%
17	My teachers have time to help me.	14%	55%	28%	3%
		Often	Sometimes	Almost never	Never
23	The classroom is too hot or too cold for me.	16%	48%	28%	7%
30	The noise in the classroom makes it hard for me to learn.	14%	39%	31%	15%
		Very true	Somewhat true	Not very true	Not at all true
49	My teachers help me to learn.	35%	57%	7%	1%
57	I find it difficult to learn because of the noise in the classroom.	12%	32%	35%	21%
64	I would learn better if I were in a smaller class.	34%	28%	22%	16%

Appendix 9: Included and excluded items from the ESA test

Questions associated with each of the Essential Skills indices

Communication Skills

19	I am encouraged to express my opinion.
27	I express my feelings through writing.
34	I get to practise my listening skills.
43	We are encouraged to share our ideas in class.
63	We read a variety of material, such as newspapers, books, magazines, fiction and non-fiction.
80	I am encouraged to ask questions
Excluded:	
6	I read independently.
47	We view and discuss videos and movies.
54	I am encouraged to improve my handwriting.
55	I am encouraged to improve my keyboard skills.

Numeracy Skills

1	I use a calculator in my work at school.
8	I use numbers in my schoolwork.
18	When I do maths calculations I get the right answer.
26	I use mathematical skills in subjects other than maths
32	We use graphs and charts to express information.
37	We interpret information in graphs, charts and tables.
45	I get to use measuring, technical or scientific equipment.
70	I am encouraged to set my work out well in maths.
Excluded:	
11	I estimate to get a rough answer before using a calculator.

Information Skills

7	I use computers to find out information.
20	I use the resources in the school library or information centre.
25	The textbooks help me to learn.
35	I use the internet for schoolwork.
42	I have to decide what is opinion or fact.
44	I have to look for my own information to complete my schoolwork.
62	It is important to present my written work well.
79	I use a variety of ways to present information.
Excluded:	
50	I would do better at school if I could use computers more often.

Problem-solving Skills

24	My schoolwork involves solving problems.
28	My schoolwork requires me to use my imagination.
31	I look at different solutions to the same problem.
33	I try out my own ideas.
36	I am asked to think about how I can improve my work.
39	I design and/or make things.
41	My schoolwork requires me to think up new ideas.
53	I am encouraged to try different ways to solve problems.

Self-management and competitive Skills

21	I set goals for my learning.
46	I am encouraged to try new things.
48	I feel pleased with the work I do at school
61	I am encouraged to stand up for my rights at school.
76	The things that happen at school help me to feel good about myself.
81	My school experiences help me to cope with difficulties in my life outside of school.
87	I feel excited about learning new things.

Excluded:

4	The work at school is too hard for me.
9	The work at school is too easy for me.
78	My teachers help me too much.

Social and Co-operative Skills

29	I help to keep the school tidy.
38	I work as part of a group.
51	At school I am taught to be kind to others
60	I have opportunities to make friends.
67	The others in my class help me to learn.
69	At school I learn ways to work better in a group.
73	At school we look after each other.
77	The people at my school respect each other.
82	People who can be trusted are valued at my school.
83	I will be a better citizen because of things I learn at school.

Excluded:

40	I take part in cultural activities such as concerts, school social events, kapa haka etc.

Physical Skills

2	I participate in exercise programmes or physical education with the class.
3	I take part in school sporting activities outside of class time.
16	Before I use tools or science equipment I am shown how to be safe with them.
59	School helps me develop my personal fitness and health.
66	I learn and develop physical skills at school.

72	The types of sporting activities at school suit me.
84	At school I learn about healthy eating.
85	I can learn relaxation skills at school.

Excluded:

75	I get to use equipment in the classroom as much as the other students in my class.

Work and study Skills

12	It is important to hand in my schoolwork on time.
22	Things I learn outside of school time are useful at school.
56	My schoolwork is related to my everyday life.
58	School is preparing me to keep learning for my whole life.
65	I can find out at school about the careers I'm interested in.
68	I am held responsible for the things I do at school.
71	I can get help at school to know what my strengths are.
74	I am encouraged to work well.
86	I am aware of areas where I need to develop or improve.

Excluded:

5	I work on my own, without help from others.
52	I am able to take the subjects I want to.

Environment for learning

10	I feel safe at school.
13	Things are explained to me in a way I can understand.
14	I have enough time to complete my homework.
15	School is a good place to be.
17	My teachers have time to help me.
49	My teachers help me to learn.

Excluded:

23	The classroom is too hot or too cold for me.
30	The noise in the classroom makes it hard for me to learn.
57	I find it difficult to learn because of the noise in the classroom.

Items that were excluded from the indices

Number	Wording	Reversal	Intended index
4	The work at school is too hard for me.		Self
5	I work on my own, without help from others.		Work
6	I read independently.		Com
9	The work at school is too easy for me.		Self
11	I estimate to get a rough answer before using a calculator.		Num
23	The classroom is too hot or too cold for me.		Env
30	The noise in the classroom makes it hard for me to learn.	Yes	Env
40	I take part in cultural activities such as concerts, school social events, kapa haka etc.		Soci
47	We view and discuss videos and movies.		Com
50	I would do better at school if I could use computers more often.	Yes	Inf
52	I am able to take the subjects I want to.		Work
54	I am encouraged to improve my handwriting.		Com
55	I am encouraged to improve my keyboard skills.		Com
57	I find it difficult to learn because of the noise in the classroom.	Yes	Env
64	I would learn better if I were in a smaller class.	Yes	Env
75	I get to use equipment in the classroom as much as the other students in my class.		Phys
78	My teachers help me too much.	Yes	Self

Appendix 10: Results of a factor analysis on items used in ESA indices

The following gives a possible structure for the ESA data using the results of Factor Analysis using Principal components, selecting 9 factors, followed by Oblique rotation. For each factor or grouping, a possible name, the number of items, and the Cronbach's alpha value is given.

Factor A: Work, 9 items, α = 0.79

Number	Text	Intended Index
74	I am encouraged to work well.	Work
58	School is preparing me to keep learning for my whole life.	Work
68	I am held responsible for the things I do at school.	Work
71	I can get help at school to know what my strengths are.	Work
70	I am encouraged to set my work out well in maths.	Num
83	I will be a better citizen because of things I learn at school.	Soc
82	People who can be trusted are valued at my school.	Soc
62	It is important to present my written work well.	Inf
25	The textbooks help me to learn.	Inf

Factor B: Undefined, 4 items, α = 0.56

85	I can learn relaxation skills at school.	Phys
84	At school I learn about healthy eating.	Phys
81	My school experiences help me to cope with difficulties in my life outside of school.	Self
8	I use numbers in my schoolwork.	Num

Factor C: Contribution, 16 items, α = 0.81

21	I set goals for my learning.	Self
87	I feel excited about learning new things.	Self
27	I express my feelings through writing.	Com
41	My schoolwork requires me to think up new ideas.	Prob
31	I look at different solutions to the same problem.	Prob
22	Things I learn outside of school time are useful at school.	Work
33	I try out my own ideas.	Prob
79	I use a variety of ways to present information.	Inf
28	My schoolwork requires me to use my imagination.	Prob
15	School is a good place to be.	Env
56	My schoolwork is related to my everyday life.	Work
42	I have to decide what is opinion or fact.	Inf
34	I get to practise my listening skills.	Com

29	I help to keep the school tidy.	Soc
39	I design and/or make things.	Prob
44	I have to look for my own information to complete my schoolwork.	Inf

Factor D: Satisfaction, 7 items, α = 0.72

13	Things are explained to me in a way I can understand.	Env
17	My teachers have time to help me.	Env
14	I have enough time to complete my homework.	Env
48	I feel pleased with the work I do at school	Self
49	My teachers help me to learn.	Env
12	It is important to hand in my schoolwork on time.	Work
18	When I do maths calculations I get the right answer.	Num

Factor E: Physical, 5 items, α = 0.69

72	The types of sporting activities at school suit me.	Phys
3	I take part in school sporting activities outside of class time.	Phys
66	I learn and develop physical skills at school.	Phys
2	I participate in exercise programmes or physical education with the class.	Phys
59	School helps me develop my personal fitness and health.	Phys

Factor F: Social, 9 items, α = 0.75

73	At school we look after each other.	Soc
77	The people at my school respect each other.	Soc
67	The others in my class help me to learn.	Soc
76	The things that happen at school help me to feel good about myself.	Self
10	I feel safe at school.	Env
38	I work as part of a group.	Soc
60	I have opportunities to make friends.	Soc
69	At school I learn ways to work better in a group.	Soc
51	At school I am taught to be kind to others	Soc

Factor G: Communication and other, 11 items, α = 0.79

43	We are encouraged to share our ideas in class.	Com
19	I am encouraged to express my opinion.	Com
80	I am encouraged to ask questions	Com
46	I am encouraged to try new things.	Self
61	I am encouraged to stand up for my rights at school.	Self
53	I am encouraged to try different ways to solve problems.	Prob
36	I am asked to think about how I can improve my work.	Prob
63	We read a variety of material, such as newspapers, books, magazines, fiction and non-fiction.	Com
65	I can find out at school about the careers I'm interested in.	Work
16	Before I use tools or science equipment I am shown how to be safe with them.	Phys

86	I am aware of areas where I need to develop or improve.	Work

Factor H: Numeracy, 5 items, α = 0.64

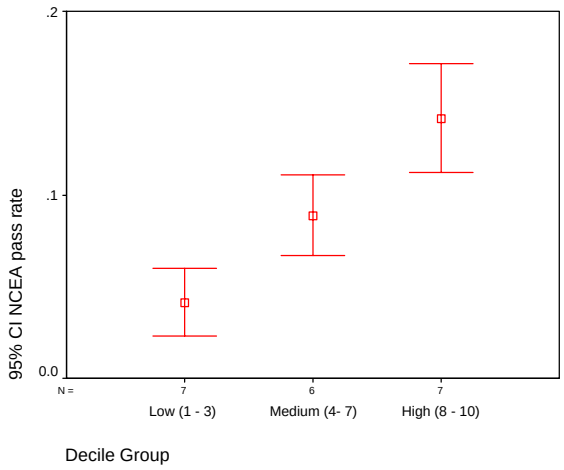
37	We interpret information in graphs, charts and tables.	Num
32	We use graphs and charts to express information.	Num
45	I get to use measuring, technical or scientific equipment.	Num
24	My schoolwork involves solving problems.	Prob
26	I use mathematical skills in subjects other than maths	Num

Factor I: Equipment, 4 items, α=0.51

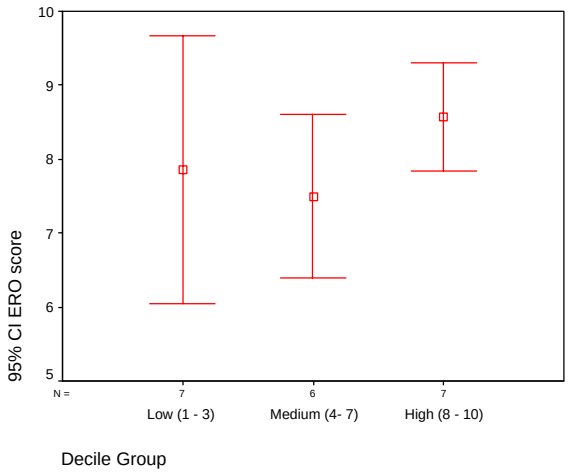
35	I use the internet for schoolwork.	Inf
7	I use computers to find out information.	Inf
20	I use the resources in the school library or information centre.	Inf
1	I use a calculator in my work at school.	Num

Appendix 11: Scores by Decile Groups of schools

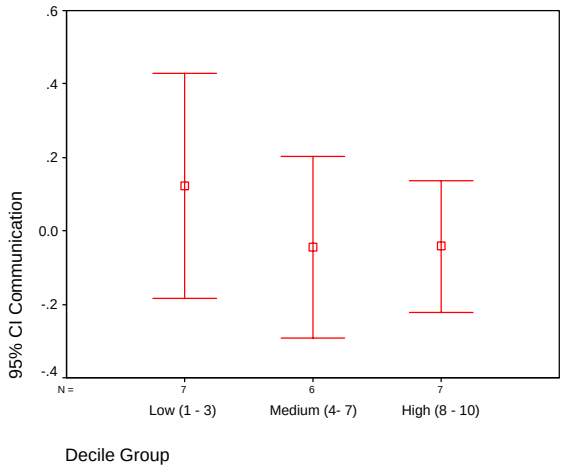
NCEA pass rate



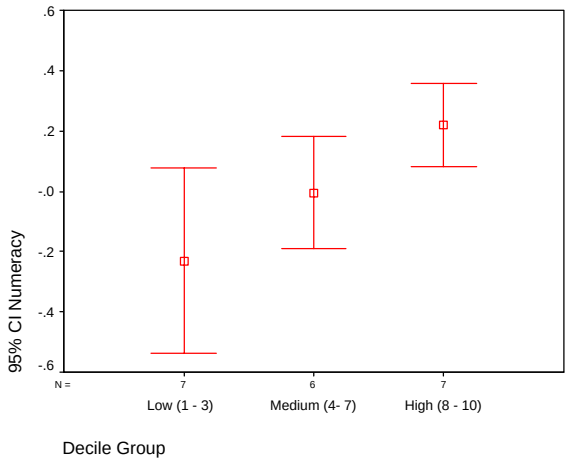
ERO score



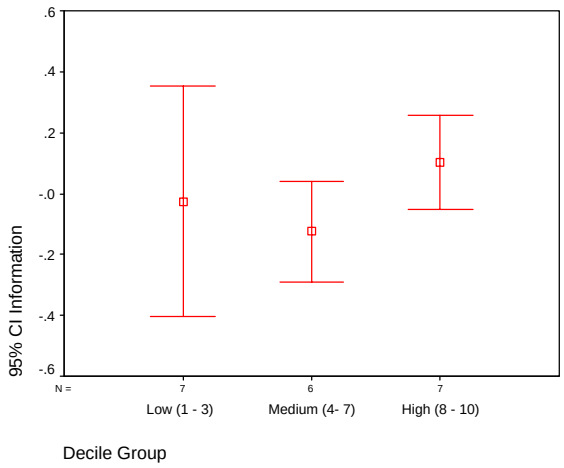
Communication Skills



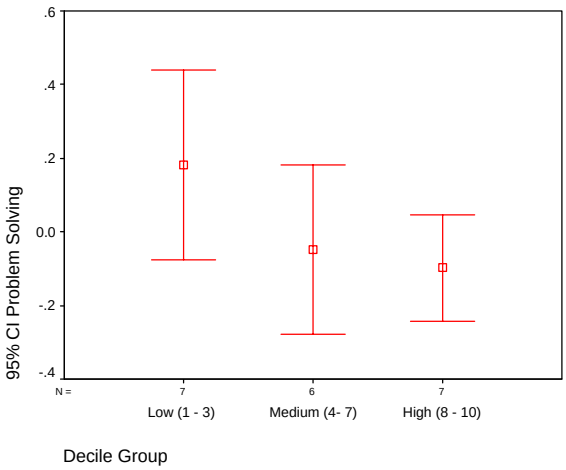
Numeracy Skills



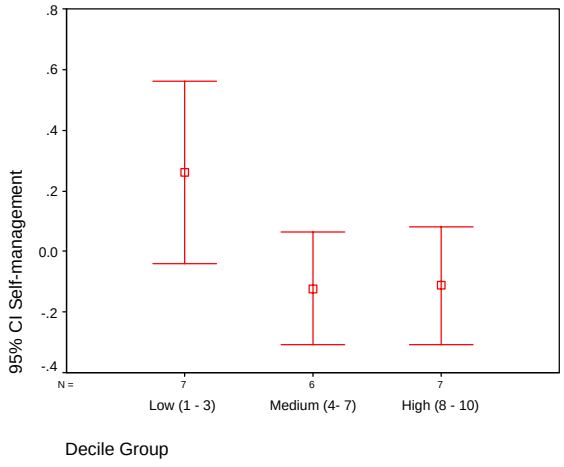
Information Skills



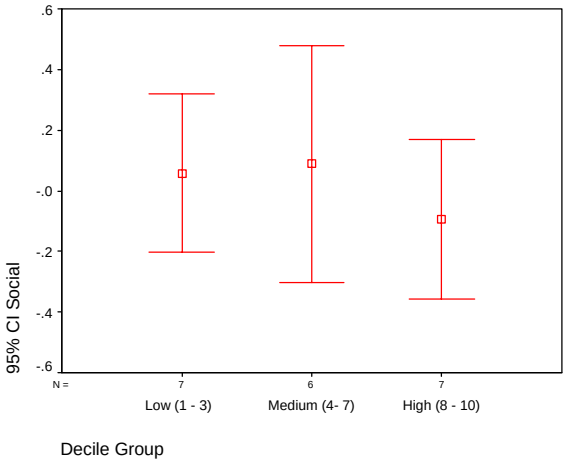
Problem Solving Skills



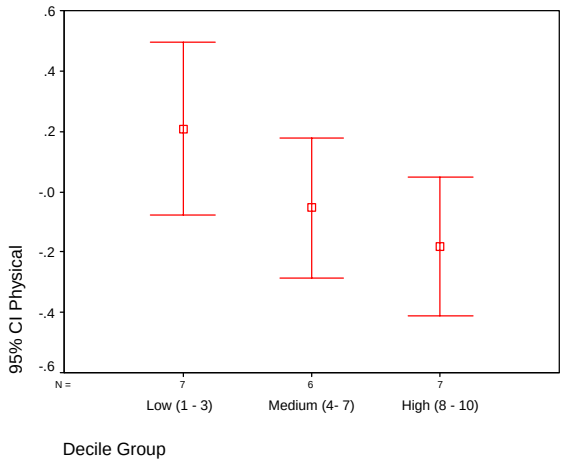
Self-management Skills



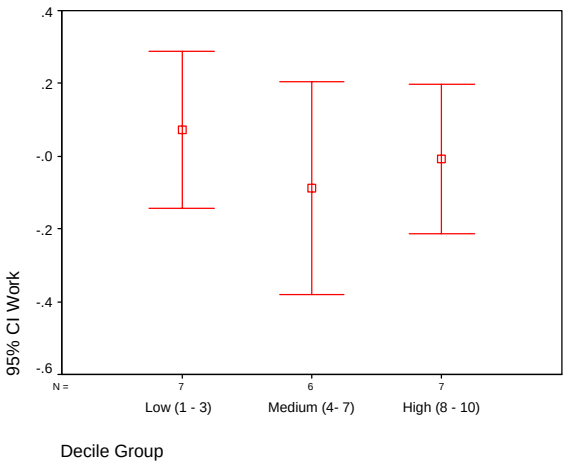
Social and Co-operative Skills



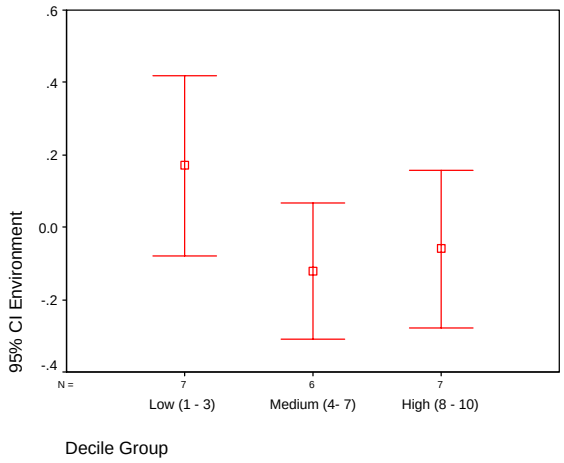
Physical Skills



Work and Study Skills



Environment for learning



Appendix 12: Correlation and Factor analysis on ESA index values

Note that for the correlations, all values are statistically significant with p values of 0.000.

Correlation Matrix

	Communication Skills	Numeracy Skills	Information Skills	Problem-solving Skills	Self-management and Competitive	Social and Co-operative Skills	Physical Skills	Work and Study Skills	Environment for learning
Communication Skills	1.000	.464	.562	.599	.621	.567	.386	.616	.473
Numeracy Skills	.464	1.000	.558	.501	.415	.402	.245	.513	.408
Information Skills	.562	.558	1.000	.579	.568	.469	.352	.603	.419
Problem-solving Skills	.599	.501	.579	1.000	.600	.527	.400	.582	.396
Self-management and Competitive	.621	.415	.568	.600	1.000	.659	.539	.698	.574
Social and Co-operative Skills	.567	.402	.469	.527	.659	1.000	.549	.645	.506
Physical Skills	.386	.245	.352	.400	.539	.549	1.000	.496	.410
Work and Study Skills	.616	.513	.603	.582	.698	.645	.496	1.000	.544
Environment for learning	.473	.408	.419	.396	.574	.506	.410	.544	1.000

Rotated Component Matrix[a]

	Component			
	1	2	3	4
Communication Skills	.810			.277
Problem-solving Skills	.742	.228	.374	
Self-management and Competitive	.650	.401		.406
Work and Study Skills	.583	.363	.336	.369
Social and Co-operative Skills	.541	.522		.349
Physical Skills		.929		
Numeracy Skills	.209		.898	.219
Information Skills	.555		.604	
Environment for learning	.225		.216	.891

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Appendix 13: Forms for data collection

The forms have had most of the spaces removed. The following forms are included:

Parent questionnaire

School questionnaire

Teacher questionnaire

RTV data confirmation and collection form (These had student data in them for the RTVs to confirm)

Student questionnaire (excluding the ESA test as this is already included in its entirety in Appendix 7)

The consent forms are all similar. The consent form for the parent and the student is in this appendix.

Questionnaire for parents

This is to be completed by the parent/caregiver of a young person with vision impairment in year 9, 10 or 11 in a regular school in New Zealand in 2003.

Thank you for agreeing to participate in this research.

Please complete the following form and return it in the envelope provided.

Be assured that your responses will be kept strictly confidential.

If you do not wish to answer these questions but are happy for your child to take part in the research project, please return the consent form.

1	Name of young person with vision impairment				
2	Current School				
3	Year level (please circle)	9	10	11	
4	Subjects taken in term 4 of this year: (Please circle and write in any others)	English	Maths		

For the following questions, please circle the response that best applies to your child and you.

5	How happy are you with the education your child is receiving this year?	Very happy	Happy	Not happy	Very unhappy
6	How happy are you with the attitude of the school to your son/daughter?	Very happy	Happy	Not happy	Very unhappy
7	What best describes the attitude of the principal of the school to learners with special needs?	Supportive	Neutral	Not supportive	
8	How would you rate your involvement as a family in your child's education?	Very involved	Involved	Not very involved	

Any other comments:

Thank you for your participation. Your replies will be kept confidential and secure.

Questionnaire for schools

This is to be completed for the school attended by young person/people with vision impairment in year 9, 10 or 11.

Thank you for agreeing to participate in this research.

Please complete the following form and return it in the envelope provided.

The information should apply to the 2003 school year. If your school covers more than years 9 to 13, please answer the questions with regard to the number of students in years 9 to 13, as well as for the whole school.

1	Name of School:		
		Total school	Years 9 to13
2	Number of ORRS funded students on the school roll who are verified as having Very High Needs. (All special needs – not just vision impairment.)		
3	Number of ORRS funded students on the school roll who are verified as having High Needs. (All special needs – not just vision impairment.)		
4	Number of students at the school identified as having moderate needs, and who receive some assistance from the Special Education Grant.		
5	Total number of students on the school roll.		
6	Decile rating for school.		

Any other comments:

Thank you for your participation.

If you have any questions please call Nicola Petty at 03 364 2190, or email nicola.petty@canterbury.ac.nz.

Teacher questionnaire

This is to be completed by each English, Mathematics or Science teacher of a young person/people with vision impairment in year 9, 10 or 11 in term 4 of 2003. If you teach more than one class involving a young person with vision impairment, please complete one form for each such class.

Please read the following note before completing the questionnaire.

NOTE: You are invited to participate in the research project, "Identifying resource needs for the education of learners with vision impairment" by completing the following questionnaire. The aim of the project is to evaluate the levels and kinds of educational resources provided for learners with vision impairment in New Zealand in years 9 to 11. The project also aims to compare the opportunities to learn that learners with vision impairment have compared with the regular population. This is the last stage in this project which has already involved administering a questionnaire to 1300 students. It is funded in part by the Royal New Zealand Foundation of the Blind.

The project is being carried out as a requirement for a PhD by Nicola Petty under the supervision of Dr Terri Green at the University of Canterbury. Nicola may be contacted at 03 364 2190 and will be pleased to discuss any concerns you may have about participation in the project. Dr Green is also available at 03 364 2987 ext 7013. The research project has been approved by the Human Ethics Committee of the University of Canterbury.

This questionnaire is confidential, and you will not be identified as a participant.

By completing the questionnaire it will be understood that you have consented to participate in the project, and that you consent to publication of the results of the project with the understanding that the anonymity of all parties will be preserved.

Thank you for agreeing to participate in this research.

Please complete the questions on the other side of this form and return it in the envelope provided. If you teach more than one class including young people with vision impairment, please complete one form for each class.

Terminology:

For the purposes of these questions, **a person with vision impairment** is someone who receives additional resources through ORRS funding or the Special Education Grant because of his/her vision impairment.

A person with special needs is someone who receives additional resources through ORRS funding or the Special Education Grant. This includes those with vision impairment.

A **"class year"** is the number of classes times the number of years. For example, if you had two classes with children with special needs in them in one year, that would count as two "class years".

(If you are not sure, please write out the details, and it will be sorted out later, or email me.)

If you have any questions at all please call Nicola Petty at 03 364 2190 or email nicola.petty@canterbury.ac.nz.

If you would like to receive a copy of the results, please give your name and address below or contact me separately by email.

1	What is the name of the young person/people with vision impairment that you teach in this class?	
2	What subject do you teach this person/people?	
3	What is the total number of pupils in this class?	
4	How many teachers (not teacher aides or trainees) are there in the class? (This is usually one, except in special units.)	
5	How many students with **vision impairment** are there in the class?	
6	What is the total number of students with **special needs** in this class?	
7	How many years of experience as a teacher will you have had by December 2003?	

8	For how many years of have you taught classes which included children with **special needs**? (Count "class years" – see over)	
9	For how many years of have you taught classes which included children with **vision impairment**? (Count "class years" – see over)	
10	What training have you received for teaching learners with special needs?	
11	Was the training helpful?	

Any other comments:

Thank you for your participation.

RTV data confirmation and collection form

November 2003

Data confirmation form for Fred Turnpike

This is to be completed by the RTV of a young person with vision impairment in year 9, 10 or 11 in a regular school in New Zealand.

Thank you for agreeing to participate in this research.

The following data has been provided by the Vision Education Agency with the permission of the participants and their parents. We would like you to confirm the details, and fill in or clarify any points that need it. It is very important that we get the best data possible on this small group of children. If you find it hard to put your response in the terms given, please write out what you mean and we will code it. Feel free to write extra comments on the backs of the pages.

If you have any questions at all, please call Nicola Petty at 03 364 2190 or email nicola.petty@canterbury.ac.nz.

The following data from the Vision Education Agency database has been printed out for confirmation or correction:

Description	**Data as entered in VEA database**	**Tick if correct, or comment, correct or add information**
Family name	**Turnpike**	
First name	**Fred**	
Gender M/F	Male	
Date of birth		
Number of children in family	3	
Family place	3rd	
Parents/Guardians		

Address		
Address 2		
Phone Home		
Region		
RC code	XVRC	
Nationality	New Zealand	
Language	English	
Race/Ethnicity	NZ Maori	
Braille user	Yes	
Print user	No	
Vision impairment congenital?	Yes	
Age at onset	Birth	
Visual status	Blind	
Vision impaired with additional disabilities	No	
Description of additional disabilities		
School name	Kilmarnock College	
Learner's year level	10	
Number of previous schools/centres attended	2	

Education Setting	Secondary	
Frequency of IEP	Half Yearly	
Mother at most recent IEP	Yes	
Father at most recent IEP	No	
SE2000 category	Very High	
Fundholder	GSE	
ACC Claimant	No	
RTV Visits per term	20	
Distance of learner from centre	30 km	
Average time taken travelling to learner	0 hours 20 minutes	

Average hours per term of service from RTV.

If you were filling this in now, would you change these figures? If so, please give the new value, otherwise tick next to the figure.

	Current need	Correct?	Current provision	Correct?	Difference	Correct?
Direct teaching	30		20		10	
Assessment	1		1		0	
Consultation, meetings and appointments	20		17		3	
Program preparation, report writing and	13		13		0	

follow up						
Preparation of special format and resource materials	12		12		0	
Total	76		63		13	

School based support

Description	Data as entered in VEA database	Tick if correct, or comment
ORRS teacher	0 hours per week	
Teacher aide	31 hours per week	
Special needs co-ordinator	3.5 hours per week	
Material production	5 hours per week	
Other		

Is **Fred Turnpike** getting any input from other specialist services? Please describe. This might include Orientation and Mobility, physiotherapy, speech therapy, TDL…

Please describe how the 0.1 or 0.2 ORRS teacher funding is used, if this is applicable, or if Fred receives any assistance through the school's Special Education Grant. (SEG)

What equipment does Fred use?

Is there any other equipment that is needed?

Part B

(Note that if you have already completed this form for another young person, you do not need to fill in questions 3 and 4 again.)

1	Name of learner with vision impairment	
2	Name of Resource Teacher:Vision	
3	Number of years you have worked as a	

	Resource Teacher: Vision	
4	What training do you have to perform this role?	

For the following questions, please circle or highlight the response that best applies to the learner in question.

5	The student's general ability can be described as:	Slower than average	Average ability	Bright, able	
6	The student's attitude to learning is:	Low motivation	Average motivation	Highly motivated	
7	How would you rate his/her self advocacy skills?	Poor	Adequate	Good	
8	How is the student's social interaction with adults?	Poor	Adequate	Good	
9	How is the student's social interaction with peers?	Poor	Adequate	Good	
10	How would you rate the family's involvement in the student's education?	Not very involved	Involved	Very involved	
11	What is the attitude of the principal of the school where the student attends towards learners with special needs?	Unsupportive	Neutral	Supportive	
12	How competent is the student's teacher aide in their role?	Not competent in this role	Competent enough	Very competent	
13	(For braille students) How proficient at braille is the student's teacher aide?	Inadequate Braille knowledge	Adequate braille knowledge	Proficient at braille	Not applicable

Thank you for your participation. Your replies will be kept confidential and secure.

Participant questionnaire

This is to be completed by a young person with vision impairment in year 9, 10 or 11 in a regular school in New Zealand.

Thank you for agreeing to participate in this research.

Please complete the following form and return it to the researcher. Please ask if you have any questions.

Your responses will be kept strictly confidential.

a	Name	
b	How long have you been at this school?	

For the following questions, please circle the response that best applies to you.

c	How much help do you get from your teacher aide?	Not enough	About right	Too much
d	How much help do you get from the resource teacher: vision?	Not enough	About right	Too much
e	How much help do you get from an Orientation and Mobility instructor?	Not enough	About right	Too much
f	What best describes the attitude of the principal of the school to learners with special needs?	Supportive	Neutral	Not supportive
g	How would you rate your family's involvement in your education?	Very involved	Involved	Not very involved

h What would help you to learn better at school?

Any other comments:

Letter to parents and consent form

Wednesday, 20 August 2003

To the parents of a young person with a vision impairment in year 9,10 or 11 at high school.

Dear parent(s)

You and your son/daughter are invited to participate in the research project, "Identifying resource needs for the education of learners with vision impairment."

The aim of this project is to obtain information on the levels and kinds of educational resources provided for learners with vision impairment in New Zealand in years 9 to 11. The project also aims to examine the opportunities to learn for learners with vision impairment compared with the regular population. This is the last stage in this project which has already involved administering a questionnaire to 1300 pupils in years 9 to 11. It is funded in part by the Royal New Zealand Foundation of the Blind.

Your son's/daughter's involvement in this project may involve the completion of a questionnaire regarding their school experience. This questionnaire will take between 15 and 30 minutes to complete. Your involvement, as parent(s) is to consent to their participation, and to answer the short questionnaire attached to this letter.

In addition, data relevant to this study will be collected about your son/daughter from the school, Visual Resource Centre and Vision Education Agency. This will include information about your child and his/her disability and abilities, and the levels of resource provision. Any data and responses regarding your child will be kept confidential to the researcher, Nicola Petty. The results of the project may be published, but you may be assured of the complete confidentiality of the data gathered in this investigation. The identity of the participants will not be divulged, nor results presented in a way that any participant may be identified. A report will be sent to all participants at the completion of this stage of the study.

The project is being carried out as a requirement for a PhD by Nicola Petty under the supervision of Dr Terri Green. Nicola may be contacted at 03 364 2190 and will be pleased to discuss any concerns you may have about participation in the project. Dr Green is also available at 03 364 2987 ext 7013.

The project has been reviewed and approved by the University of Canterbury Human Ethics Committee.

All pupils in years 9 to 11 with vision impairment are being invited to participate in this study, and the more who do, the better will be the results. We ask you to participate. If you agree to do so, please read and sign the enclosed consent form, and complete the attached questionnaire and return in the envelope provided as soon as possible. There is a copy of the consent form provided for you to keep for your records.

Yours faithfully

Nicola Petty	Dr Terri Green
Lecturer	Senior lecturer

Nicola Petty

Department of Management

University of Canterbury

Private Bag 4800

3 September 2003

CONSENT FORM

Identifying resource need for the education of learners with vision impairment.

Participant (the young person with vision impairment)

We have read and understood the description of the above-named project. On this basis I consent to participate as a subject in the project, and to the publication of the results of the project with the understanding that anonymity will be preserved.

I understand also that I may at any time withdraw from the project, including withdrawal of any information I have provided.

Name of participant:

Signature:

Date:

Parent/Guardian

We have read and understood the description of the above-named project. On this basis we give permission for my/our son/daughter(s) to participate as a subject in the project, and we consent to the publication of the results of the project with the understanding that anonymity will be preserved.

We understand also that we may at any time withdraw from the project, including withdrawal of any information we have provided.

Parent's name:

Signature:

Date:

Appendix 14: Variables used for building models of opportunity-to-learn

The following table lists the variables that were used in developing models to explain opportunity-to-learn for learners with vision impairment.

Variable	Details	Indices for which it featured in the model
year_9, year_10 and year_11 or Year	Indicating which year the student is in	Physical Skills, Self-management Skills
pnthap	Is the parent happy with the education their child is receiving that year? 1= Very unhappy, 4= Very happy.	None
par school	Is the parent happy about the attitude of the school to their son or daughter? 1= Very unhappy, 4= Very happy.	Physical Skills
Pntprinc/stuprinc	Parents'/students' assessment of the attitude of the principal to learners with special needs 1= Not Supportive, 2= Neutral, 3 = Supportive	Communication, Self-management, Social, Work and Study Skills and Environment for Learning
Pntfam/stufam	Parents'/student' rating of involvement as a family in their child's education 1 = not very involved, 2 = involved, 3 = very involved	Self-management, Social, Work and Study Skills and Environment for Learning
gender	boy = 1, girl =0	Communication, Information Skills
computer	Is there a computer at home that they can use? 0=No 1= Yes	Communication Skills
matsize	number of students in the maths class	Problem Solving Skills
Engsize, scisize	number of students in the English or Science class	None
famsize	number of children in the family	Communication Skills
Freqiep, mumiep, dadiep, pariep	how many IEP meetings are held each year, mother, father, number of parents at previous IEP meeting	eliminated as highly correlated with SE2000. (0 for all moderate needs)
rtvasad	advocacy skills (assessed by RTV), 1 = Poor, 2 = Adequate, 3 = Good	Numeracy Skills
meddec	School is in decile 4-7	Physical Skills
hn, vhn	If student is High needs or very high needs, 1 = yes, 0 = no	None
CBA (cost-based aggregate)	Estimated weekly cost of service provision	
avefam	Average assessment of family's	None

	involvement as a family in student's education. 1 = very involved, 2 = involved, 3 = not very involved.(Combines parent, student and RTV opinions)	
aveprinc	Average assessment of the attitude of the principal to learners with special needs 1=Not supportive, 2= Neutral, 3 = Supportive. (Combines parent, student and RTV opinions)	None
pakeha	1 if pakeha, 0 if other	Self-management Skills
Disttime	Time for RTV to get from the VRC to the student	None
Provtot, Needtot, difftot	Total hours provided, needed and the difference	None
Rtvasab, rtvasat	RTV assessment of ability and attitude	None
bigvrc	1 if served by one of the big VRCs	None